Report of
The Maryland Agricultural Society—
Maryland Farm Bureau Federation,

INCLUDING REPORTS OF THE

Maryland State Horticultural Society,
Maryland Crop Improvement Association,
Maryland State Beekeepers' Association,
Maryland Vegetable Growers' Association,
Maryland Stockmen's Association,
Maryland Poultrymen's Association,
Maryland Tobacco Growers' Association,
Home and Community Committee Meeting,
4-H Club Conference.

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REPORT OF THE

MARYLAND AGRICULTURAL SOCIETY

THE

MARYLAND FARM BUREAU FEDERATION

INCLUDING THE REPORTS OF

The Maryland State Horticultural Society
The Maryland Crop Improvement Association
The Maryland State Beekeepers' Association
The Maryland Vegetable Growers' Association
The Maryland Stockmen's Association
The Maryland Poultrymen's Association
The Maryland Tobacco Growers' Association
Home and Community Committee Meeting
4-H Club Conference

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BALTIMORE, MD.

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LETTER OF TRANSMITTAL

To His Excellency, Albert C. Ritchie,
Governor of Maryland

SIR:

I herewith submit to you as directed by the Act incorporating the Maryland Agricultural Society, and also the Horticultural Society, this report for the year 1931, which contains a detailed statement of the receipts and expenditures of the Society as approved by the Executive Committee and Advisory Council. It contains the proceedings of the Sixteenth Annual Meeting of the Maryland Agricultural Society, Maryland Farm Bureau Federation, and annual meetings of the Affiliated Associations.

I trust that an inspection of its contents will convince you that the funds appropriated for this purpose have been wisely and judiciously expended.

Respectfully submitted,

F. M. PAYNE,
Secretary.

March, 1932,
Baltimore, Md.

THE MARYLAND AGRICULTURAL SOCIETY
THE MARYLAND FARM BUREAU FEDERATION

Sherwood Building
Baltimore, Md.

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REPORT

of

SIXTEENTH ANNUAL MEETING

of the

Maryland Agricultural Socitey

the

Maryland Farm Bureau Federation

BALTIMORE, MARYLAND

WEDNESDAY AFTERNOON

January 6, 1932

The First Session of the Sixteenth Annual Meeting of the Maryland Agricultural Society, Maryland Farm Bureau Federation, held in the ballroom of the Hotel Lord Baltimore, convened at two-fifteen o'clock, Mr. James W. Davis, president, presiding.

PRESIDENT JAMES W. DAVIS: I wish to call this meeting to order. It certainly gives me a great deal of pleasure to see that the farmers of this State are taking enough interest in their own business to bring together a meeting of this size. I think it shows that we are all in earnest, and are going to do everything possible to make things better in the coming year.

It is my duty at this time to introduce to you as your presiding officer for this afternoon's session, Mr. E. Thomas Massey, vice-president of our organization. Mr. Massey.

CHAIRMAN MASSEY: Ladies and gentlemen, members of the Farm Bureau: I can't say it gives me great pleasure to preside, because I don't think any of us like to preside at a meeting. It is more fun sitting down in the audience.

But I think we have a wonderful crowd here. You wouldn't think we had a depression in Maryland in looking over this crowd, and I think it shows that you are determined to live through and come out of it.

As your presiding officer this afternoon, it gives me great pleasure to introduce to you Honorable Howard W. Jackson, Mayor of Baltimore, our beloved city.

HON. HOWARD W. JACKSON: Mr. Chairman, ladies and gentlemen of the convention: Your presiding officer said that he couldn't honestly say he feels happy in presiding. Well, of course, you understood what he meant, because most of us like to be with the crowd. But I can say that I am happy to come here and welcome you to this convention. I am happy to welcome you to Baltimore. Looking over this crowd is nothing new, for a great many of you come to Baltimore often. In fact, I have seen a great many of you in a great many different places. (Laughter). I don't mean what you mean! What I mean is that I had the honor, pleasure, and privilege of being in Chicago early in December with Governor Ritchie's party, and I had the distinct pleasure of attending for a few moments, the national convention of the American Farm Bureau Federation, and there I saw a great many that I see here today.

I also had the honor and privilege of attending a dinner a few weeks ago of the canning industries, the packers and the can manufacturers and allied industries, and I saw a great many present on that occasion that I see here today. In fact, having been born in Baltimore county, I can say I was very proud when Harford county ran away with all the honors on that occasion, because all the awards made to people who have grown more than ten tons of tomatoes to an acre went to Harford county on that particular occasion. (Applause).

Of course, as a politician I probably would have liked to see one go to another county. Then I could have talked to each of them, and if they went to three counties, then I would have more to talk about, etc. But nevertheless, I

am very glad and happy to be here and to welcome you on this occasion and make you feel that you are welcome in Baltimore.

If you don't mind, I will tell you a little story about Baltimore. The story is told about a colored boy who was born and raised in Baltimore. He left here and was gone several months. When he came back some of his friends said to him, "Jo, tell us where you have been, and what your experiences were."

He was a little backward, and so one fellow said, "Tell us one place you have been."

He said, "One place I visited was Boston."

"Did you have a good time in Boston?"

"No, I can't say I did. You know, those New Englanders are very cultured people, particularly the Bostonians, and all they ask you up there is what you know. I was frequently embarrassed. Then I came down to New York. The New Yorkers are entirely different. All they ask of you is what have you got. That made me suspicious. So I came back to Baltimore, where they ask you—what will you have?" (Laughter).

You certainly don't want me to talk about politics, politicians, or anything of that kind, because those words are misapplied very frequently. In fact, I feel sorry for people who say they don't want anything to do with politics or politicians because if you are not interested in politics, you are not interested in your government, and if you are not interested in politicians, you don't care who runs your government.

But I am glad to come here, because I can go back a little way, and remember when the farmer was not organized. I can remember when they didn't get together and talk over their affairs. That is what you are doing in this convention. I can remember when there was no order, there was chaos on the farm, in fact, I can go back to the time when it was hardly known. Today it is known. The farmer of today, the agriculturist of today is a highly technical,

organized man, in my opinion, compared to what he was a few years ago, and the more you conduct the business end of your farm along well-established business lines, the more successful you are going to be as a farmer. You have got to know, of course, how to put in your crops and how to harvest them and all that. There is no use of my talking to you about the practical side of farming. But when you do begin to apply business methods to agriculture, then in my opinion you put yourself in a position to be more successful as farmers than you would be otherwise.

I don't know that I have any particular message for you at this season of the year. I do, however, feel privileged, and I am glad to say that when you come to Baltimore, you can be proud of this metropolis of your State, because I can truthfully say today that in no city in the United States are they in better financial position, at least to my knowledge. A great many are worse off than Baltimore City. We balanced our budget this year, that is, for the year 1932, but it took a great deal of hard work to do it. We are proud of balancing that budget in order that the tax rate may not be more than it was last year, in order that the government may cost the people of Baltimore less in 1932 than it did in 1931. I am very proud of it, and I never lose an opportunity to make reference to the fact that the city employees contributed out of their salaries for 1932, $940,000.00 in order that the tax rate might remain as it was in 1931.

I feel privileged in taking a few moments of your time to mention that, because I think Marylanders and Baltimoreans have a right to be proud of it. In other words, we can pay our school teachers, and we have paid them up to date. This morning we had $2,223,000 in the bank, even though the stock we offered for sale on the 5th of the month only received a bid of 84, but we didn't sell it for that because it is worth more. I had Mr. Graham apply to a banking institution here yesterday, just one day after we had been offered 84, for the city stock, and he wanted to buy a few thousand dollars worth for the pension funds, and they asked 87, so I think we were wise in not selling at 84.

I am sure you don't want me to take up any more time to tell about Baltimore. As Marylanders we are proud of Baltimore, and as Baltimoreans we are proud of Maryland, and we are glad to have this convention here. I welcome you, I greet you on behalf of the people of Baltimore, and wish you health, happiness, and a prosperous new year. (Applause).

CHAIRMAN MASSEY: Your Honor, I thank you on behalf of this convention for your warm welcome. We are glad to come to Baltimore. We have tried other cities and towns, but we have come back to Baltimore for our annual meeting, and I think we are all glad when the annual meeting comes here. I believe the ladies have a good time. I don't know what the men do.

Next on the program is the Annual Address by the president of the Farm Bureau Federation, James W. Davis. It gives me great pleasure to call on Mr. Davis. (Applause).

PRESIDENT'S ANNUAL ADDRESS

By JAMES W. DAVIS

Rocks, Maryland

Mr. Chairman, Fellow Farm Bureau members, ladies and gentlemen attending this Sixteenth Annual Convention of the Maryland Agricultural Society-Maryland Farm Bureau Federation:

Our secretary-treasurer, Mr. Frank M. Payne, will give you a detailed report of the accomplishments of your organization for the past year.

I will call to your attention some of the things that are of interest to us at this time.

The annual convention of the American Farm Bureau Federation which was held in Chicago the first week in December, was attended by your president and secretary. Mr. E. I. Oswald represented the Extension Service, Mr. J. W. Jones, Montgomery county; Mr. H. H. Nuttle, Caroline county; Mr. Joshua Lynch, Baltimore county; Mr. Roy

C. F. Weagley, Mr. Wilson and Mr. Ankeney, Washington county.

We had a very interesting and harmonious convention. Mr. E. A. O'Neal was re-elected president, Mr. Charles E. Hearst, vice-president, and all members of the board whose terms expired were re-elected.

The program was very interesting and instructive and was given close attention by the Maryland delegation.

Our delegation was especially honoured in having the privilege of presenting our Governor, the Honorable Albert C. Ritchie, to the convention. His remarks were well received and the impression made was very pleasing.

The convention was unanimous in its decision to give its full support to the Federal Marketing Act and the Farm Board, and if it is found necessary to amend the Marketing Act, to be sure it is amended by its friends and not by its foes.

The need of tax revision was another subject that was earnestly considered and I feel sure that plans to equalize the burden will result.

The legislative department of the the American Farm Bureau Federation, of which Mr. Chester Gray is the head, is very efficient and works very closely with the Grange and other farm representatives at Washington.

Attendance at the American Farm Bureau Federation convention was good, and there was a general feeling among members that we were there for the purpose of improving the position of those engaged in agriculture, and no effort would be spared in the endeavor to accomplish our purpose.

I was asked at the Chicago meeting how we had accomplished such results in holding membership? My reply was "Team Work." Mr. Massey, our vice-president, has been always ready and willing to respond to every call for assistance, and has always been very effective in his work.

Mr. Payne has been untiring in his efforts and has kept everlastingly at it. The presidents, secretaries and direc-

tors of the county farm bureaus have labored long and faithfully and have always done very efficient work. Earnest and loyal members have done their part; the extension service, headed by Dr. Symons and Mr. Oswald, and composed of the county agents in the counties of this State, have all given their best, and the result is that you still have an organization to represent you of which you can be proud.

Not all of the States have maintained their full membership,—some have had a small loss, others have increased, but I am glad to say that Maryland was one of the States that paid more membership dues this year than last.

I am sure we all realize how important it is that membership be maintained. With many members it is possible for us to accomplish great things for our benefit, but without them we are almost helpless.

At this time when business and finance all over the world are in turmoil and trouble, when industry is unemployed and many are hungry, I believe the farmer is more able to weather the storm than many others.

One of our major needs in this State is a careful study of our tax law with a view to giving needed relief to real estate which now bears a burden out of all proportion to the income produced by it. A commission has been appointed by the Governor to make this study and we will do all we can to secure such relief as you are entitled to receive.

The financial condition of your organization is stronger than it has been for many years. We felt that it was necessary to practice the utmost economy in order that our finances be strengthened for the rough going that may be ahead, and the treasurer's report will show that we have had a fair measure of success. In the future the same policy should be pursued and our finances should be conserved in every way possible, consistent with the best service that your organization can give.

I feel that we should look to the future with confidence and a firm determination to do all that is possible to improve the condition of the agricultural inter-

ests of the State and nation. We should work in harmony and co-operation with the other organizations in the State which are striving so earnestly toward the same end, and I am sure success will crown our efforts.

The Agricultural Corporation of Maryland which is our purchasing organization, in co-operation with the Grange and Maryland State Dairymen's Association, has had a successful year. The tonnage of feed, fertilizer and twine has been large, although feed shipments were not as large as last year when the tonnage of feed was almost double because of the short crop caused by the drought.

In the grain marketing department, in spite of the low price of wheat, which caused much wheat to be fed to livestock, we have made a large increase in the bushels handled, and when plans now being considered are carried out, I believe we will be able to give better service and do a much larger business the coming year.

The automobile insurance is doing a good business and is giving much satisfaction to its policy holders. Our claims are settled promptly and fairly, and while the rates have been raised, they are still much lower than old-line companies. Legislation passed at the last session of the Legislature may increase our need of insurance and it is a satisfaction to us to know that we have our Farm Bureau Insurance Company which will give us the best insurance at very low rates.

I want to say a word about some of the co-operatives in the State, one of which is the Maryland Tobacco Growers' Association. You of the southern Maryland counties know what a good job has been done by this organization, and I want to urge each grower of tobacco to support it to the limit, give it your full moral support and if you can secure the membership of all the growers you will add much to its effectiveness.

Now a word about the Maryland State Dairymen's Association. We know it is at the head of the list of successful co-operatives. I know it is well supported by its members

by the way the request of the manager to hold down production has been complied with, and I would advise every member to continue that support, and when you hear the story, as you often do, that there is no over-production, go to your manager and get the facts before you make plans to increase production, for this is the only way we can continue the wonderful success of this association.

The Maryland-Virginia Milk Producers' Association markets the milk produced in the portion of our State adjoining Washington, and has a close tie-up with the Maryland State Dairymen's Association and is securing good prices for its members.

The Interstate Association markets a large part of the milk produced on the Eastern Shore and the prices secured are better than in many sections of the East.

Now, these statements show that we have much to encourage us as to the way our produce is being marketed and the future does not seem near as dark as we might think when we look at the bright side and consider our efficient marketing facilities and what they are doing for us.

I cannot but feel the future is bright with all of the advantages we Maryland farmers have. Our University with Dr. Pearson, that man we all love, at its head. Our experiment station with Dr. Patterson, who has spent his life improving methods of production. The extension service under Dr. T. B. Symons, who accomplishes so much, and every county agent doing a real job to make things better on the farm.

CHAIRMAN MASSEY: Next on the program is the roll call of the counties.

Roll Call. All affiliated counties reported present.

CHAIRMAN MASSEY: Next is the report of our secretary-treasurer, Mr. Frank M. Payne. It gives me great pleasure to call on Mr. Payne for his report. (Applause).

ANNUAL REPORT OF SECRETARY-TREASURER

F. M. PAYNE

1931

Mr. President, Fellow Farm Bureau members, ladies and gentlemen: It hardly seems possible that a year has gone by since you entrusted me with the responsibility of the office of secretary-treasurer of this great organization. I am encouraged to feel that there have been accomplishments that are proving of benefit to the agricultural interests of our State; and am equally confident that what has been done this year will prove a sure foundation for our future endeavors. The splendid and loyal co-operation which the officers of the county farm bureaus, the affiliated organizations, the Maryland State Board of Agriculture, and the Extension Service has given has been most encouraging, and with such outstanding men and women to work with I entertain no fear for the future of our organization. I express my appreciation for the capable manner in which my predecessor, Mr. Stewart, filled this office before me, and many times during the year have I felt grateful for having succeeded so efficient an executive. We wish him to feel that it was our work added to his that made the accomplishments of this year possible.

Wool Marketing

The 1930 Maryland Farm Bureau Wool Pool handled 103,320 pounds of wool for 401 members. The 1931 pool handled for 240 members, 53,507¼ pounds of wool, and has advanced $7,516.03. Final settlement for the 1930 wool pool was delayed until after this year's clip, and those members who received 20c a pound and finally the 3c a pound additional did not, in the majority of cases, pool their wool this year, not accepting the conditions that made this delay unavoidable. While this delay in final settlement was indeed very unfortunate, I am sure that had it not been for

the National Wool Marketing organization, the price, that would have been received in 1930, would have been from 30 to 40% lower. Wool merchants throughout the country were unable to receive credits, and it was the revolving fund of the Federal Farm Board that worked most effectively to the benefit of the producers. Final payments to all shippers in the 1930 pool were made on June 13 this year. All the members of the 1931 pool received 14c a pound advance and will receive additional payments, it is anticipated, prior to March 1st.

There is no question of the opportunity that is ours, to increase the revenue from the raising of wool by marketing co-operatively. This is one commodity where consumption is greater than production, and the tariff can be made effective to the benefit of the producer, if he will but assemble his product under one selling agency, and avoid speculation.

Grain Marketing and Co-operative Purchasing

The report of our activities in these two departments of service, which is being rendered by our purchasing department, the Agricultural Corporation of Maryland, will best be made jointly for the year 1931, for the use of wheat as feed reduced the number of bushels we handled and, at the same time, was the reason for the fewer tons of feed purchased for our members. We are, indeed, in sympathy with this program of feeding and have adjusted the management of our organization to conform with this economic practice.

We, however, handled approximately 270,000 bushels of wheat; some 20,000 bushels more than last year, and our purchases for our farmers amounted to $618,708.05. Comparing the lower cost for feed, supplies and grain, the more noticeable decline in business done in feed occurring after July 1, we feel that the volume of business done is comparable with our previous year. You can be assured that we will continue to render a service that will prove a great saving to our farmers.

Legislation

All resolutions passed at our last annual meeting were introduced in the Legislature. Resolutions asking for the—"Punishment of Poultry Thieves—Protection Against Disposal of Stolen Poultry and Livestock," did not receive favorable reports by legislative committees and were looked upon as bad legislation.

Two bills were introduced regarding butter substitute, one—"Dealing with the Terminology and Enforcement", the other "Prohibiting Its Use by State Institutions."

A strong and effective lobby killed these bills in the judiciary committee, and we advance as the reason, that proper time was not given to prove that the legislation asked for was fair and just, and not a law to deprive the "poor man of poor man's butter."

The National Bill to restore the 10c tax on colored oleomargarine, however, was won and our State organization, with all other State groups, prevailed upon our Maryland representatives to vote favorable.

Your resolution, regarding weights and measures, would have been passed had not measures of similar nature been previously introduced with better chances of passage, only to be defeated in the last hours of the session. We worked out a very satisfactory plan with the commissioner of automobiles regarding the inspection of gasoline pumps and are hopeful that we will secure at the next session, a law giving to our farmers the same protection as is now enjoyed in Baltimore City.

Your resolution, regarding "Papers Showing Pedigree Pure-Bred Livestock", was introduced and passed, and is now a law.

Other bills, which were introduced and passed, were: Co-operative Trucking Law, giving the right to farmers to haul for their neighbors for hire; a New Fertilizer Bill, giving further protection to the buyer.

Your resolution regarding Taxation, was carried out to

the letter, and the tax committee of your organization was given the opportunity to meet with the Senate committee on taxation and gave their approval to their report which was adopted. The Governor has since signed a bill and appointed the committee, and we are satisfied that the finding will be favorable to our policy that "taxes will be levied according to ability to pay", and that permanent relief will be given to those now paying taxes on farms and real estate.

Many sections of the State had the opportunity to study and discuss, prior to its introduction, the "Grade and Standard Bill for Farm Products", which our organization sponsored; but it developed that, after its passage, a number of farmers were opposed to it and the bill received the Governor's veto. We were in sympathy with this action, not because we did not feel it to be important legislation and an advantage to the farmers, but that postponement would give more time for further discussions, and we are confident that a bill giving to our farmers the advantage of a law, establishing grades and providing inspection of their product, will be desired by them; and it will be our purpose to provide time and place for discussing the merits of the bill prior to the next session of the Legislature.

Several bills were introduced which were unfavorable to our farmers, and were defeated; among which was a bill to increase the license fee on trucks.

Mention should be made regarding the co-operative trucking bill affecting the transporting of milk. When this bill became a law, it did not give the privileges hoped for, and it will be our job to work with other interested groups and secure the passage of a measure that will be effective.

It is my hope that our program for the 1933 Legislature will be adopted by this convention, so giving the opportunity for me to sit in council with each county farm bureau and their county legislators, in joint meeting, far in advance of the time the Legislature convenes, so enabling all concerned to be not only fully informed and prepared, but in agreement, rather than present a divided opinion before our

law makers as has so often been the case. Our Farm Bureau is unquestionably the medium through which all farm groups can be brought together to this end.

Livestock Marketing

Your organization has made, with the valued help of the Extension Service, many studies preparatory to setting up a co-operative marketing agency for live stock producers, but in each case, has it been the decision that the production in our State could not support such an agency. J. W. Jones, who serves as chairman of our livestock committee, with Charles T. Cockey, Jr., reported to our board on November 24, after attending all meetings of livestock producers from Maryland, Virginia, West Virginia, Tennessee, North Carolina, New Jersey, New York and Pennsylvania, that these several States have agreed to set up co-operative sales agencies in Baltimore, Lancaster, and New Jersey, affiliated with the National Live Stock Marketing Association, which is the commodity organization, under the plan of the Federal Farm Board, in administering the Agricultural Marketing Act. Our board gave its approval and endorsement to Mr. Jones' report and voted to underwrite the necessary expense needed to further the plan, but has delayed the work of submitting the plan to our producers, in view of giving more time to discussing and comparing other plans advanced by those in our State who rank high in the knowledge and experience of co-operative marketing, and whose judgment we accept as being the wisest of counsel. As the question now stands, at the time this report is being written, a livestock marketing agency for our Maryland producers is assured, and a board meeting has been called for January 5, to decide if the set-up will be confined to a State organization or affiliated with the several neighboring States as the Eastern Livestock Co-operative Marketing Association.

Automobile Insurance

We have now been rendering the service of insuring the automobiles of the farmers of Maryland for nearly 4 years and have, during this period up to and including December 31, 1930, written 12,551 policies. There have been cancellations for the same period of 5,352 policies, leaving us now in force 6,999 policies.

The total number of claims since we began business in Maryland is 3,078, and we have paid out $138,718.23. From January 1 of this year until November 31 inclusive, we have received 1,049 claims, and have paid out $57,180.83.

In view of general business conditions, we would naturally expect a far greater falling off in our sales than was experienced this year, but I am happy to report that the personnel in charge of this branch of our service, Mr. R. W. Richert, as well as Messrs. Karns and King, represent the highest possible type of men available to carry on this work. I do not recall one instance where they have failed to co-operate to the fullest degree, and I am confident that any claim or misunderstanding that may arise will be treated with every degree of fairness.

Transportation

There has been, of course, a number of minor services to be rendered during the year in securing for our members adjustment in freight rates and tariffs. Our big problem of the year was to combat the proposed general increase of 15% in freight rates asked for by the railroads. Economists figured that the granting of the 15% increase would have meant an increase cost of $19.50 to every farm family.

Our State organization, we feel, lent valuable assistance to the national organization in making this fight, the result of which was the exclusion of agricultural products almost entirely, and the same economists estimate the increase cost to the farm, on the basis of the rate allowed by the Interstate Commerce Commission, at $4.00 a year per farm, instead of $19.50.

Publicity

We have continued to send to our members the *Bureau Farmer,* which we feel has carried not only a great deal of information regarding our organization and its endeavors, but has proven entertaining by the addition of several features that have been carried throughout the year.

It is, at this time, that we refer to the untimely death of Mr. James M. Hoblitzell, who had been the editor of our State publication from the time this organization started. We all will miss the distinctive talents which he possessed and gave so freely in making the publication a success.

During the year, much publicity has been given our organization through the State-wide Beauty Contest, which will enter into its final stages at this convention when capable and impartial judges will decide who, of the sixteen contestants, will be Miss Maryland Farm Bureau. The contest has proven a very interesting feature, and has helped the attendance at all of the summer gatherings in the respective counties. There is always an appeal in a contest of this kind, to the press, and our State organization has been given a great deal of free space not only in the columns of the newspapers throughout our State, but we have received clippings from papers from nearly all of the State federations throughout the country, showing pictures of the contestants as well as appropriate reference to the Maryland Farm Bureau's activities.

Outstanding among the many gatherings of Farm Bureau folks this year, was Farm Bureau Day at Timonium Fair. The officers of the Timonium Fair Association, Messrs. John M. Dennis, president, and M. L. Daiger, secretary, and their board of directors co-operated in every way possible, and it is felt that on Tuesday, September 8, there was assembled in the grandstand, at the Timonium Fair to take part in our State-wide Muster Day program, the largest gathering of organized farmers that has ever been brought together at an event of this kind in our State.

You, no doubt, have read in your local papers, on the average of twice a month, press releases which have come from

the State office dealing with Farm Bureau activities. We ask you to watch for these news items in the future.

Membership

We have, for the year 1931, in addition to the eight affiliated organizations, 2,148 farm families who have paid their membership. While we knew that a loss would be inevitable, we feel that to come through this year of depression and bank failures with an actual loss of around 350 members, goes far in registering the stability of our organization. On the basis of five adults to a family, our membership for 1931 is 10,740. There are several hundred more who are really entitled to be considered as members. Many, whose membership expired during the last several months of this year, have asked their county officers to hold them on the membership list until after the first of the year, feeling that they would, at that time, be in a better position to make payments. While we could not include them in the foregoing report, we will most assuredly consider them as members for the immediate future, at least. When I tell you that one county, alone, is holding 120 checks on banks that failed after the checks were given, you will understand my reason for the above reference.

We were not unprepared to meet this condition, and have, from the very start managed the money for dues which you have sent us, so that we have at this time available funds amounting to $8,144.94 as compared to $3,354.19 when I took over the office.

It was our policy, when we made plans for 1931, that there would be no membership campaign, but rather we would increase the State help to the county organizations in maintaining their membership. The results bespeak the splendid co-operation and effective manner in which this has been carried out. I feel that, at no time, in the history of the Maryland Farm Bureau Federation does our membership represent more nearly a volunteer membership than now. Surely a splendid foundation upon which to build.

It is our plan that, early in February, not only the county officials, but the workers in each local, will be brought into a regional meeting and receive from the national organization the same information regarding membership building that formerly was given in the annual training schools for executives.

Conclusion

I have referred previously in this report to the splendid co-operation of the officers of the county farm bureaus, the affiliated organizations, the Maryland State Board of Agriculture, and our extension service as a whole. It is a grand thing to be able to say so, and not only mean it but, to feel the comfort and assurance which such loyalty gives. Many times have I referred, in like manner, to our county agents in the many speeches I have made over the State, and when I now thank them for their splendid unselfish help and interest, I am expressing an appreciation which I mean most sincerely and am confident the work ahead will be made a little bit easier because of their interested co-operation.

Mr. Davis, our president, has made it a pleasure for me to work with him, and I have come to feel that he can be counted on to make every effort to increase the service of our organization to its members.

We have, indeed, a busy future ahead of us. Let us believe in, and have faith in, and work with and for our organization. I know of no better resolution for this the New Year than that you be resolved to keep informed as to what your Farm Bureau is doing for you every day; an informed membership will mean a larger membership.

SCHEDULE 1.

Statement of Receipts and Disbursements for period from January 1, 1931, to December 31, 1931

RECEIPTS:

County Dues	$6,441.00
Subscription to Co-Op	1,074.00

A. F. B. F. Dues	1,074.00	
Associated Membership Dues	180.00	
Non-Farm Bureau Members	45.00	
Farm Bureau Organization Expense	7.00	
Medals	25.00	
Publicity Advertising	871.22	
Auto Insurance Commissions	2,219.08	
Auto Insurance Renewals	5,415.50	
Office Expense	260.15	
Telephone	.15	
Annual Meeting 1931	1,587.40	
Annual Meeting 1932	5.63	
Bonding Expense	69.60	
Rent	1,941.30	
T. Fair Expense	388.67	
Interest Earned (Bank)	44.40	
Interest Earned (Liberty Bonds)	.47	
Traveling Expense	290.65	
Total Income for Period	$21,940.22	
Bank Balance January 1, 1931	3,354.19	
Available Cash		$25,294.41

DISBURSEMENTS:

Legal Expense	$ 50.00	
Farm Bureau Organization Expense	97.94	
Bad Checks	10.00	
Wool Pool Organization Expense	13.80	
Board of Directors	933.90	
Publicity	1,076.83	
Salary Sec. & Treas. (Stewart)	220.16	
Salary Sec. & Treas. (Payne)	3,500.00	
Salary Clerks	2,331.00	
Salary Publicity	380.00	
Salary Accountant	187.50	
A. F. B. F. Dues	1,155.50	
Office Expense	895.12	
Rent, Telephone & Telegraph	2,838.02	
Annual Meeting Expense 1931	2,204.94	
Annual Meeting Expense 1932	99.46	
Bonding Expense	99.80	
Auto Expense	296.51	
Executive Committee	48.00	
T. Fair Expense	502.14	
Traveling Expense	948.85	
Saving Account	2,000.00	
Liberty Bonds	2,040.00	
Total Disbursements for Period		21,929.47
Bank Balance January 1, 1932		3,364.94

SUMMARY

STATEMENT OF LIQUID ASSETS DECEMBER 31, 1931

LIQUID ASSETS:

Cash in Bank Dec. 31, 1931 (Checking Account)	$3,364.94
Cash in Bank Dec. 31, 1931 (Saving Account)	2,000.00
Government Liberty Bonds	2,040.00
Accounts Receivable, Due and Collectible	740.00
Total Liquid Assets Dec. 31, 1931	$8,144.94

CHAIRMAN MASSEY: Our next speaker on the program I have known ever since he has been in the State. I think it is a pity every one of us doesn't know him personally, for to know him is to love him. It gives me great pleasure to introduce to you now Dr. R. A. Pearson, president of the University of Maryland. (Applause).

DR. R. A. PEARSON: Mr. Chairman, fellow farmers, members of the Farm Bureau: A friend of mine who has lost as much of this world's goods as any one I know of among all my acquaintances, sent me a few days ago a Christmas greeting. I am sure many of you have heard it; it is an old rustic rhyme, and it goes like this:

"The roads are blocked,
The pump is froze,
The cider's gone,
And the goose et up.
The chores ain't done,
We're short on hay,
But Merry Christmas,
Anyway."

In that spirit of optimism and good cheer, I wish you all a happy New Year. If only I could express in words my New Year's wish from the University of Maryland to the farmers of Maryland, those words would be thrilling indeed. I want to tell you, it does me lots of good to attend these annual meetings. When I look over this audience and I see Davis, Payne, Massey, Ensor, Snader, Heaps, Parr,

Gardner, and others whom you have chosen as your leaders, I feel that we in Maryland are particularly fortunate. I want to congratulate you upon the leadership which you have set up, and upon the splendid, loyal support that you are giving these men.

Now, I believe with Mayor Jackson that we don't want to spend too much time raking up memories of the old troubles. I am not a crepe hanger. I am not the kind of a person whom I must tell you about. He dropped in to see a neighbor who had been sick for many long weeks, and a number of times the poor fellow thought he was going to die, and his friends thought so, too. But he always came back. This particular visitor dropped in to cheer him up. After making a few remarks the visitor's eyes seemed to be attracted to the door of the room. He stared at it; he stopped talking, put his hand in his pocket, took out a ruler, and walked over and measured the door. The sick man said, "Bill, what are you doing? What's the matter?"

"Oh, nothing," he said, "I was just wondering if that door was big enough to get a coffin through!"

I am not going to do that, but I am going to ask you as scientists to review with me very briefly a few facts that are more or less familiar, but I want to arrange them in a somewhat interesting order. You know that farmers are scientists. There isn't a good farmer in this audience but what is practicing science a good part of the time from morning to night, and we are all trying to learn more of these sciences, and how to apply them to our problems. The gross income, all they got, all the farmers in the United States in 1919, that is twelve years ago, was $14,000,000,000. Two years later it was a little less than $7,000,000,000, and it stayed down year after year, and in 1931 it was still down there at $7,000,000,000.

Now, the total national income, the income of all the people, including the farmers in 1919, was $67,000,000,000. Take out the $14,000,000,000, and the rest of the folks got $53,000,000,000 in 1919. Two years later when agriculture

had been pretty thoroughly deflated, the grand total of the whole country was $68,000,000,000. Take out the $7,000,000,000 and the rest of them got $61,000,000,000 in 1921 as compared with $53,000,000,000 in 1919.

In 1931 all of us together got $84,000,000,000. Take out the $7,000,000,000 that the farmers got, and the rest of them got $77,000,000,000. Does that give you a word picture of these last twelve years? The farmers have gone down the toboggan slide on income. The rest of the folks are way up high, and they have been going up higher.

In 1919 the farmers of this nation received one-fifth of the gross income of the whole nation. In 1921 it was one-eleventh, one part in eleven went to the farmers, and in 1931 it was one-twelfth. Now, I want to say to you that one conclusion to be drawn from that right away is that the farmers of this nation are exceptionally efficient. Let's be willing to admit that. Honestly, I don't believe any other group could have taken a loss like that and maintained it over such a period of time and made anything like the showing that the farmers of this nation have made.

In spite of that very large national income, recently there has been considerable suffering outside of agriculture. The troubles of most of our friends not in agriculture began about a year and a half ago when we read under big headlines in the newspapers that the Stock Market had crashed. Quotations of stock of one of the largest copper companies, the Anaconda, have fallen in those recent months from $130 a share to $9 a share. One of our great transcontinental railroads has fallen from $115 a share to $12. Chrysler Motor Company fell from $105 or $110 down to about $13 a share. Steel stocks and public utilities have suffered severely. Some men who were millionaires and so accepted two years ago, today are looking for jobs, and they are not dictating the pay that they will receive. Within three weeks I received a letter from a friend of one of those men asking me if it wouldn't be possible in some way to find a job for that former millionaire's

wife. In other countries the situation is pretty much the same.

Now, it is not necessary, and it would not be profitable, and it certainly would not be very cheerful to dwell for any length of time on this painful financial subject. I want to emphasize the fact that I think Mr. Davis mentioned in his address, that although there are exceptions in various localities of the country, Maryland has been especially favored. Oh, folks, let us be thankful that we live in Maryland. (Applause).

During the holidays I visited the western part of New York State where I once served as State Commissioner of Agriculture, and it is a State which I know pretty thoroughly, I found that those fine dairy farmers up there are selling milk for eight cents a gallon, mind you, not eight cents a quart, two cents a quart. They live in nice homes, and they are terribly worried about the situation.

Not long ago I met a man who had just been down to Kentucky where tobacco is such an important crop. He said he was driving along a country road and stopped to talk to a farmer who was living on a particularly poor looking farm, pretty much covered with rocks, and he said, "My friend, do you own this farm?"

"Yes."

"Well, how can you make a living here?"

The fellow said, "Well, I'll tell you. You see that man down there in the pasture? Well, he is my hired man. At the end of the year when I pay my bills I ain't got nothing left for him, so I give him the farm. The next year he hires me, and at the end of the year he will give the farm back to me!"

Farmers as a whole, as a class, and there are a number of them in Maryland, too, we won't blink at the facts, although Maryland has its wonderful points of advantage, there has been plenty of difficulty in this State as well—farmers in the country at large have been carrying on a strenuous battle against depression, not for a year and a

half since the Stock Market broke, but for eleven years or more. What an opportunity for eloquence in reference to the ability, the poise, the resourcefulness of farmers! Why, the total taxes on farm property have more than doubled since 1919.

Mr. Davis referred to the commission appointed by Governor Ritchie to study this tax problem. Everybody admits I think now, that the farmers are patiently carrying more than their share of taxes. Every one I have talked to admits it, anyhow. But it is a pretty big proposition to get things readjusted, and careful study must be made into all phases of the problem, and I believe Governor Ritchie has appointed an exceptionally capable group of men to take up this study. I think that their work may be almost revolutionary in its results. We will see; we will hope.

Since 1914 taxes on farm property have gone up two and a half times. Everything a farmer buys has increased very greatly in cost. Farm machinery, building materials, and seeds particularly have almost doubled in a short period of years, and the prices the farmers have been receiving have been going down, particularly of late, so that now they are only about seventy per cent of what they were in normal times before the war.

Boiling it all down into one sentence, we are told that the purchasing power of the farmer's dollar in the fall of 1931 was only about 58 per cent of what it was some twenty years earlier.

Now, Mr. Chairman, two questions are uppermost in your mind, and the minds of all of us. First, how long is this going to last?

Every one has high hopes that the depression soon will end. It seems to me that they must come into realization now soon. Some so-called authorities are more optimistic than others. I believe, farmer friends, that the opinion is becoming more and more accepted, more widely accepted, that prosperity cannot be even reasonably wide-spread again in this country until the farmers of the country are

in position to buy and build. One pair of shoes purchased for every farm in this land would mean six million pairs of shoes, and think of the factories in Massachusetts and in St. Louis that would have to start up and run overtime to make those shoes. An average of $200 expended on every farm in this country for new machinery, and goodness knows they need more than that, they have been putting it off and repairing, an average of $200 on each farm and $300 in painting and repairing the buildings, little things that they all have been postponing which they knew were needed, would mean about $3,000,000,000 going into industry, and that would start the wheels of the mills and the factories and the railroads. It would thaw out a lot of frozen banks. What a joyful thought it is.

Now, why is it that I say, wait for the farmers? Because the farmers constitute the greatest group of wealth producers. Transportation and selling at wholesale and selling at retail are necessary, but they do not increase the nation's inventory like the work of the farmers. The farmer is a creator of new wealth. At the end of a season he has brought wealth into existence that never would have existed but for his efforts.

You say labor does the same. I admit it, and I give them great credit. But labor does not have at its hand the necessary capital that the farmer has in his land and buildings where he lives, and labor cannot utilize that great gift of God, sunshine, and water that the farmer can use.

Well, that is my answer to "How long is this going to last?" But let's see if we as farmers can't help to speed it up a bit. If a national prosperity is going to await for the farmers' leadership, then that does place on the farmers a tremendous responsibility, for we want this whole nation to be prosperous, we want the cities to be prosperous, industries, and labor, they are all our friends and brothers and sisters and cousins, and the same blood that we are. We don't want to go up and have them stay down.

Well, what are the farmers going to do? In the first

place, like every one else, they are going to carry on as best they can.

You know after all is said and done, that is the best of it all. I have alluded to this farmer spirit in the United States. Really, I don't think there is anything superior to it in the world in any group. These farmers carrying on are going to have the very best help from their county agents, from their agricultural colleges, from the extension departments and the experiment stations; they are going to have the benefit of research and instruction, and assistance from the Federal Department of Agriculture. Their systems of marketing through co-operatives will be strengthened as far as possible with the aid of a Federal Farm Board. There is no doubt about the Federal Government being in sympathy with the farmers. Unfortunately, though, while it assists them with one hand, it checks them with the other.

I sometimes think that the statement of that Spaniard who had visited this country a short time ago may have some truth in it. He said, "Those Americans, they be a people of opposites. They like the cocktail. They put in whiskey to make it strong, and then water to make it weak. Then they put in lemon to make it sour, and sugar to make is sweet. Then they say 'Here's how', and they drink it themselves!" (Laughter).

So our dear old Uncle Sam wants to be good, but surely, I don't think he always lets one hand know what the other is doing. Do you know what I am referring to? Very few people know. Very few people realize how much this Government of the United States is doing to bring new lands into cultivation. Every year new farms are being created.

In 1930 and 1931, and there are plans for 1932 already made, new farms are being created to compete with the older farmers and to help increase the excess of agricultural production above the requirements of this nation. Isn't it too bad when we are already overproducing, and a further

increase of production must have a disastrous effect? It doesn't take very much in the food line to upset prices. When you have had a good dinner for a dollar, you wouldn't give a nickel for another dinner. Enough is enough. But if food becomes a little short, prices will skyrocket as in no other kind of products on the market. The law of supply and demand works a terrible vengeance on food products.

And so these new farms that are coming into cultivation every year, I maintain have a really considerable influence on this excessive production in helping to upset prices. More than two and a half million acres are being irrigated with water from government works. That is half the size of the State of Maryland, an increase of 40,000 acres in a single year, a total value of crops on irrigated land of over $160,000,000 in one year, and since water was first made available in 1906 for this purpose, water from government works, the value of the crops, accumulative value since 1904, twenty-four years ago, $1,642,000,000.

Now, I want to know, Mr. Jones, do you know how much a billion is?

Over a billion and a half dollars worth of farm products on this irrigated land in a period of 24 years, and 40,000 farms are on that irrigated land. They spent in constructing them $195,000,000, and that isn't all. On a much larger scale dear old Uncle Sam is opening homesteads with possibilities of tremendous production. In the State of Maryland there are about five million acres under cultivation. The government in the last fifty years—it has not been decreasing down to the present date, it has been maintaining itself, the government has patented for homesteads 260,000,000 acres, which is an average of slightly more than the whole farm area of Maryland every year. In the last fifty years Uncle Sam has given out as homesteads an area equal to fifty States the size of Maryland.

Why, the oil industry is now in distress because of excess production. It would seem as sensible for the government

to go out now and open new oil wells and sell them cheap or give them away as it is to continue developing new farms. What do you think about that? Many members of Congress appreciate all these things, but oh my, the log rolling! Doubtless all of the members from Maryland appreciate the situation, and in some of these other eastern States and middle western States that are suffering worse than we are, but that is a matter that Congress as a whole must appreciate if any remedial effect is to come.

Now, our great agricultural organizations, fortunately, are going into this subject. I believe that results will follow that study and their efforts. With the aid of scientists who are especially trained, and who have facilities to enable them to work on our problems, we will find how to deal more effectively with a number of trying subjects. Our losses will be reduced, some of them may even be turned into profits. New uses for farm products are going to be found. They are coming out slowly.

I receive a letter every little while from the Commissioner of Agriculture in the State of Louisiana, and it is always about cotton. They found they can make a very satisfactory substitute for letter paper from cotton, a beautiful sheet. They are making many useful things out of corn starch now, and other articles such as old wheat straw that have formerly gone to waste. Now I am hoping that we will find some other use for some of our concentrated food products. I believe it is within a range of possibilities. Let us hope a great deal will be done in the immediate future towards better adapting production to requirements. It is far easier to do this when only three or four hundred manufacturing plants are concerned than it is to do it in agriculture where six million plants are concerned. Absolutely, we have got to do better in agriculture in this respect than we have been doing. We have got to adjust our production to the requirements.

Up in Pennsylvania recently a study was made of the source of all the food going to a medium-sized city. Where

did it come from? The farmers at the gates to that city decided that they would find out, and find out they did. They found out to their surprise when it was put down in definite form, that thousands of dollars worth of food being consumed in the city near them was being brought in from points hundreds of miles away, and a large amount of their products were being shipped hundreds of miles away.

The purpose of the study was to readapt production to the needs of the localities. The last report came to me that they were getting their eyes opened. I shall be interested to learn of its progress. Above all else, this means better co-operation on the part of the farmers. If it can be done in Denmark and in Sweden and even in Ireland, where they have the reputation of not co-operating any too well, and in Holland, and even in Soviet Russia, it can be done in these United States. Farmers who are confronted by like problems must think and act as one. We are making a lot of progress that way too, but the progress must be speeded up and be more widely extended.

A really hopeful sign came a few weeks ago with a national conference on Land Utilization called by the Secretary of Agriculture and the Association of Land Grant Colleges and universities held in Chicago. Never before was there brought together such a group of experts on this subject of land utilization. Dozens of papers were read, and finally some very constructive resolutions were passed. Mention has been made of homestead farms and irrigated lands, but they are only one in this land utilization problem. Thousands of people are trying to farm on lands that never should be used that way. There are the cut-over lands of the far north and far south, which all affect us here in Maryland, because they are coming into competition with us, even though they only raise four bushels of corn on an acre. There are the rocky farms and mountainous farms of the northeast, and the far west; there are swamp lands and lands subject to overflow, and great areas that are semi-arid and should be used only for the range and the forests. There are thousands of people living as

squatters on that land eking out a precarious existence, trying to raise wheat, oats, corn, potatoes and other products under conditions that never can be satisfactory, at least not more than one year in five.

I will never forget a trip I took in Texas during the war. I was sent down there by the Secretary of Agriculture to see what could be done to relieve a section of that State suffering severely from drought. We rode one day 300 miles in an automobile from San Antonio to San Angelo. I wish you could have been on that trip. The same conditions prevail today. We stopped at one god-forsaken looking little place. We saw a woman in dirty, ragged tatters, barefooted, standing by a bonfire with three little children, dirty, ragged, barefooted youngsters by her. We drove in and stopped, and I asked her if her husband was there. She said, "No, he is off haulin' water."

How far do you think he had to bring the water? Nearly ten miles. As I stood there a little child of about five years held up his little finger to me and said, "It hurts."

I said, "I am sorry. Let me look at it."

I did, and in a kindly way I took out a lense that I always carry in my pocket, thinking it was a thorn from a cactus. The woman by the way, was burning the prickers from cacti that had been brought from the dry lands to feed to their stock. I took my microscope and leaned down. That woman came at me like a savage wildcat with her pitch fork and said, "Leave that child alone!"

Naturally, I did. I said, "I wasn't going to hurt your child. I thought if he had a splinter in his finger I would take it out for him."

She said, "You may be all right, I expect you are, but there are so many people around here sent out by the Germans poisoning people, I am not going to take any chance with my children."

The destitution at that place! And perhaps one year in five they can get enough of a crop to help upset things all over the United States. Folks, it isn't the way it ought to

be. I want to say that we are paying the price of our recklessness. We have come into the wealth of this nation, and we have run into it (I don't like the comparison) like a lot of drunken sailors. Did you ever see a flaming gas well or oil well? You have seen movies of them. There that wonderful fuel which God Almighty put down in the ground for His children to use is allowed to go to waste because somebody flung a lighted match into it, and millions and millions of cubic feet of gas and gallons of oil just go up in waste.

What are future generations going to think of us? It was my honor to preside at the opening session of that Land Utilization Congress in Chicago, and I want to tell you a few lines of what I said to them. I said:

"I think a history which will be written about 200 years from now, about 2,132 will contain a chapter under the subject 'The Destroyers', and it will say the people who occupied this country two centuries ago had a strange mental complex. They thought they were the world's greatest inventors and builders. Some of their accomplishments, considering their primitive knowledge, were remarkable. In a short span of years they developed methods of making and transmitting electric power, of mechanical flight through the air, and some elementary knowledge about vision and photography on opaque substances called x-ray. With powerful apparatus they had some success in throwing sound through earthly spaces but knew nothing about communication with other planets. They fabricated steel and made buildings called skyscrapers. It was a machine age, and machines, and quantity and speed, and height were their four gods.

"They had little regard for conservation. Seemingly unbounded wealth of the natural resources were available to them. If they could not use them, they wasted them and destroyed them. Literature shows that occasionally a prophecy was made to those people that the world would soon come to an end. They must have believed these words,

for they did eat, drink, and be merry, and they did it on a colossal scale. They allowed the natural gas and oil sufficient to have lasted until now and for the next hundred years to burn in great fields. They used millions of tons of coal in a system that was frightfully wasteful. They allowed plant food to be carried into the ocean in every stream, and the whole time of millions of people today must be given to the labor of bringing it back where it may be used, the soil fertility that those destroyers allowed to escape. Fuel resources we have learned to replace, but not so with plant food.

"Occasionally a warning voice was heard, but it was like a lone voice in the wilderness. Some of the riotous waste was checked at times, but it was soon resumed."

I am afraid that that is what our descendants are going to say about us. I am telling you that because in closing I want to bring you back to this Land Utilization Conference in Chicago, for it is the brightest light that I can see in the horizon. There are lots of things working. I have touched on a few. Altogether, they are going to help towards bringing us back to prosperity. I haven't begun to mention some of the most important ones, but here is something that is just new. In this Land Utilization Conference, here are two or three of the things they recommend. They want the preparation and publication of outlook reports stating in unequivocal and understandable words the best judgment of the best experts concerning a trend of supply and demand, so that farmers may know more accurately how much they ought to plant in order to properly meet the requirements.

As to taxation, a strong resolution in reference to that, as to reclamation, a strong resolution in favor of holding down on these governmental activities until more land is truly needed. They point out that the lack of a program for use of land consistent with the public interest has resulted in consequences such as hundreds of farmers struggling against hopeless obstacles. I am giving you a word

picture of only one of them which I saw myself. Such conditions as that, we can no longer tolerate. A great deal of farm and forest land cannot be utilized profitably by private individuals because of the impossible tax burden. An important phase of the resolution is taxes. They recommend to provide for the permanent maintenance of local forests on which some are dependent or may become dependent for part-time employment. They would remove from private ownership the lands that are periodically brought into temporary cultivation under the stimulus of high prices or favorable yields.

They would remove from private ownership lands that cannot be utilized profitably by private individuals or concerns without serious wastage of the soil through erosion and other causes. They would take steps to conserve soil fertility, saving these millions of tons that are pouring down the rivers into the sea. They would have a system of land classification. They recommended a study be made of possible decentralization of industry and population from a point of view of land utilization.

What does it mean? It means that a lot of smaller factories should be moved out into the smaller towns and in the country districts where farm people may find work during a time of year that they are available, and where they may live on their farms and have the benefits of the farm homes throughout all of the year. It means that some of our largest industries in the opinion of many leading people, should be broken down into smaller units, and you know that some of the very largest ones already have recognized that principle and are adopting it in their business. It is going to have a profound effect upon all, and I think a helpful one. I don't think more people moving into country homes is going to increase production so as to interfere with farmers' markets.

I think that a thousand acres occupied by a group of families of that type with industrial connections will not produce as much food as it did when it was in the hands of

one or two or three good farmers, and I think that will be a help to agriculture, just as it is a help to agriculture to have more golf grounds, and more airports developed throughout the country. I am for them both, because it is going to take temporarily out of competition, large areas of farm lands.

Very quickly, Mr. Carl Williams, of the Federal Farm Board, took up this matter, and he has made a recommendation for the southern States, and it applies pretty much to all the States, on these five points:

The establishment of Federal and State land planting commissions with scope and power to act.

Revision of tax systems to encourage desirable private ownership of land suitable to produce timber.

Begin at once a classification of lands in the distressed areas. New York State has just passed a constitutional amendment providing that the State may buy up areas of cheap land where people are trying to farm and can't farm, and the State may throw that into their forest preserves, a very advanced step taken within the past few weeks under the leadership of Governor Roosevelt.

Public acquisition after careful analysis of idle, cut over marginal lands to prevent undesirable agricultural expansion.

Provide further educational research relating to the problem of land utilization.

Folks, the leaven is working. What we need is more great leadership and more loyal followers. We are all enveloped in a great, dense fog of uncertainty and doubt and fear. The nation is suffering from it. Once I told this story to some of you. It is a true story. I was on a ship on the St. Lawrence River, and as we were going down toward the Gulf we ran into a fog. Anchors were dropped. The officers of the ship said, "It will pass over. We will be here only a few hours."

But we stayed there from noon until night, and all night long until noon the next day. The fog was thick and got

thicker and thicker. I went out on the deck and couldn't see my hand a foot away from my face. A little later I heard the bell ring in the engine room. Then I heard the clang and clank of the anchor chains, I heard the grinding of the capstans, and I went out on deck again. The fog was as thick as ever. I wondered what they were going to do. When there was an opportunity, I asked one of the officers. He said, "We are going to move out."

I said, "How can you move out in a fog like this?"

He said, "You see that fellow up on top of the pilot house?" I could just barely see the ends of his legs. He said, "His eyes are above the fog." Sure enough, during the 24 hours we had been lying at anchor the fog settled to a point so the man could look above it. He could see the familiar hills and landmarks. He said a few words to the man on the deck, the man on the deck spoke to the man at the wheel, the man at the wheel gave signals to the engineer below, and we moved safely and comfortably out of that fog.

It is a good comparison. Our nation is in a fog. We need leaders. We are developing them. Some of them are in this room. Some of you who are thinking clearly and carefully and not emotionally and erratically are leaders, leaders in thought. We need them all over this nation. They are being developed. These hard problems are being worked on by great minds. There is a responsibility upon us all, but on none more than upon the farmers.

Again I congratulate you splendid folks of Maryland for the way you are working together. Mr. Davis said to me a little time ago, "Just think, it is almost too good to be true. All the agricultural organizations and the Extension Service, and the Board of Agriculture, all of us, are working together and not torn apart by contentions and dissentions." How fortunate. I believe Maryland will keep up her end and will be found in the front as the nation marches out of the fog. (Applause).

CHAIRMAN MASSEY: That was a wonderful address. The Secretary will announce the committees.

SECRETARY PAYNE: The committees are as follows:

RESOLUTIONS COMMITTEE

E. Thomas Massey, *Chairman*

W. S. Spencer
H. H. Nuttle
Charles T. Cockey, Jr.
J. W. Jones
J. W. Lord
R. S. Snader
D. B. McDowell
Carroll Lowe
Charles I. Boyle
Guy Phillips
James D. Davis, Jr.

CREDENTIALS COMMITTEE

Roy C. F. Weagly, *Chairman*

David G. Zentz
R. Newell Stagg, Jr.
George W. F. Insley

CHAIRMAN MASSEY: Our next speaker needs no introduction to this audience. He is the first Secretary and Treasurer the State Farm Bureau had, and I remember only a short year ago he thought we were going to have a hard winter, and he went South. Since we have had warm weather so far, he has taken a chance to come back. He doesn't want to miss a good thing, and he knows this convention is a good thing. It gives me great pleasure to present Mr. M. Melvin Stewart to you this afternoon, our former Secretary. (Applause.)

MR. M. MELVIN STEWART: Mr. Chairman, Ladies and Gentlemen: It is a pleasure to come back to Maryland. I want to say to you that I have gotten a little out of the habit of standing up before audiences. I think last April I went down and talked to a fire insurance group in Char-

lotte, North Carolina. That is the only speech I have attempted to make in that time.

I have received a very royal welcome from you good folks here. That reminds me, in a way, just about a week ago I was up here to a little family dinner. I was driving on my way back to North Carolina, and here at Fayette street, right by Howard, I was stopped by a traffic light. I had the North Carolina license on my car. The traffic light changed, and across the track from the west going east came a Maryland car, an old touring car with the transparencies broken out of the curtains. The driver spied my North Carolina license and he stopped his car and held up the traffic; he stuck his old black, shiny face out of the broken curtain and said, "Hello, North Carolina!" So no matter where I am in Maryland, I get a hail from some fellow that used to hail from down North Carolina, or if I get down there in North Carolina and get to eating my dinner, as I did one day, Mr. Dan Parson's son and his new bride walked into the lunchroom, and they were saying "Hello" to me again. So I enjoy these friendships, these contacts that I have made.

I was wondering, however, as I sat here listening to this fine report that Frank Payne had made—he said he only had a little over 2,000 members, but I noticed in the annual report you paid more dues into the National than the year before. Maryland was one of the States that made a gain. I know when I turned over the treasury to Frank I turned over $3,000 and some odd dollars. We only had two thousand some members, and only $3,000 net from those members, yet Frank made a gain and has a balance of $8,000 and is still operating the organization. I want to take my hat off to him; he is a master and a financier.

I have kept track of the Maryland Farm Bureau Federation this last year through the co-operative, and every once in a while I have dropped into Maryland, because I have this farm down here in Anne Arundel County and I have marketing problems and tax problems. I just stop in to say

hello to Frank, Mr. Davis, Mr. Englar, and the rest of them up there. I expect they got tired of seeing me come in there some times, but it was like going back home.

However, the time is fleeting. I wanted to bring you one message today, if I could, some of the observations I picked up as I traveled down into the old North State, because I look at it from the angle lots of times as a farmer here in Maryland would look at it.

The two biggest expenditures you folks have on the farms today is schools and roads. I mean your tax bills in your local counties. Isn't that true? I witnessed one of the most memorable sessions in the Legislature in North Carolina when they were deadlocked and in session for 141 days. And yet, out of that session came, I believe, three of the most outstanding acts or changes in governmental set-up that is being watched by a great many States with a possibility of following in their footsteps.

North Carolina passed one act that took all of the county roads every mile of public road in the State of North Carolina off the hands of the counties and put it into the hands of the State. The maintenance of those roads is entirely in the hands of the State government, the State Highway Commission. The county government levies not one cent for road maintenance or road construction any more in that State. They had a five-cent gasoline tax. They increased the gasoline tax to six cents, and out of that they are maintaining all of the roads of North Carolina.

Now, you may say perhaps that is a wrong step. I have seen the attempts of Annapolis to raise the gasoline tax and divert the money for other taxes than roads. It has been defeated. I believe personally that North Carolina has made a step in the right direction. It is worthy of your consideration and study and observation up here in this State.

Another thing they did—they took all—you know they have operated for some years using county prisoners on the county road systems. Every man now sentenced to sixty

days or more is sentenced to the roads, and he is turned over to the State. The State is building fireproof camps scattered at strategic points over the State, and those men are being used to work out their sentences rather than loafing in the county jails.

Maybe you think that is a backward step; you don't want to see anything like that in Maryland. However, I tell you that is what they are doing. They have got over 4,000 prisoners in that State now working on the roads.

The other big step in legislation down there was to do this. Let me say this first, that the Constitution of that State provides that there shall be at least six months of school in each county in the State. They passed a law in the beginning of the session known as the McLean Law, that provided that the State government would take over the operation of the six months' school term, and the entire expense of that should come from sources other than tax on real estate or property. And so they were deadlocked for 141 days over that. The finance committees tried to find the money. Some advocated a general sales tax, one per cent. That was defeated. A luxury tax on cigarettes, soft drinks, moving picture tickets, etc., was advocated and passed the House, and twice came within two votes of passing the Senate. In the State of North Carolina, when the Senate and the House pass the bill, it is a law. The Governor has no veto power in that State.

So what did they do? They have had an income tax in that State. They increased the income tax, they increased the franchise tax, and then they found out that they had to put a tax of fifteen cents on property in order to raise the necessary money to operate the State schools.

Now, to keep the county units, local boards who were standing the pressure from going in and raising money and increasing the burden or transferring the burden onto the taxpayers, they provided for an equalization board. No taxing unit in that State can, as far as schools are concerned, put into the budget and levy for schools any amount

until it has been approved by that equalization board at State headquarters. In this way they prevented the gain that they had made of transferring the schools over to the State, of having other moneys raised and passed on to the taxpayers. So much for that.

The other thing was this: Perhaps you read in the paper this morning the editorial about the City of Miami. You heard and read in the papers some time ago about Chicago; in fact, there was an article in this morning's paper about what the Mayor of Chicago said about the tax situation in that State, that they had to have relief from the State government if they were going to be able to continue. You know what has been the situation in Philadelphia and the situations elsewhere. We have been on for some years a regular drunken spree of spending and taxing and borrowing money.

In 1927 in that State they made the attempt to try to curb that, and they provided down there that no bonds could be sold or issued until they were approved up at headquarters by the State board. In 1929 they put strength in that law, but they did not provide that notes came under the supervision of this board, the sinking fund commission.

So what happened? They stopped the issuance of bonds, but the local taxing units continued to issue notes, and these later had to be taken up and satisfied by the issuers. In the session of 1931 this third big act that they established there, and I understand that the State of Indiana has had that for some years, that no local unit, whether it is the county, city, town, or district, can issue a bond or a note without the consent of this State board on local government. They are experiments, but they have actually stopped the upward trend of taxation. They have forced an actual reduction in that State this year of an average of forty cents.

I just can suggest those things to you. They are something that I observed. Maybe it is not worth your while here in Maryland, but if you are going to get any relief on

property tax, I believe you have got to make the man who owns no property, but who uses the roads, who sends his children to school, etc., help pay that burden and not let the man who owns farm property or the little house in the town carry the whole load.

Now, the most remarkable thing about that was a demonstration down there of six thousand farmers that poured into the City of Raleigh one day in protest, trying to get this relief. In North Carolina they do not have a general farm organization of the strength you have here in this Farm Bureau Federation. And may I commend to you this very thing. Never let your organization die down. They are turning heaven and earth down there now trying to set up some type of organization to represent the farmers and to try to get them further relief in their tax problems and in their marketing problems.

I have talked over my time. I said I was out of the habit of trying to make any speeches or talks of any kind. I just thought that these few little things I had observed in that one session of the Legislature might be of interest to you folks up here who have been trying to get your income tax and trying to get some relief from farm problems. I know in Anne Arundel county I am going to pay about $1.63 this year in taxes, and I know just how well it hits the pocketbook. I still have my farm there. If I could get a 40-cent decrease in taxes in Anne Arundel county this year, I would feel very, very happy.

I appreciate the kind invitation to come back here and talk to you folks, and congratulate you upon the splendid meeting you are having. I want to congratulate the officers here on the splendid reports they have made to you. Thank you very much. (Applause.)

CHAIRMAN MASSEY: The next speaker on the program has the subject, "The County Agent and the Farm Bureau," and he is H. R. Shoemaker, County Agricultural Agent of Frederick County, Maryland. (Applause.)

MR. H. R. SHOEMAKER: Mr. Chairman, Members of the Maryland Farm Bureau: I feel very much like the lady who was taking her first ocean voyage. After she had been out a day or two she came up to the captain one day very pale, and said, "Captain, captain, I don't know what to do; I am so sick."

He said, "That's all right, lady, don't get excited, you'll do it all right." (Laughter.)

I don't feel seasick up here a bit, but I don't know exactly what to do. It seems to me that on this program this afternoon we have had some of the finest speeches I have ever listened to. You heard the Mayor of Baltimore City, the president of your State University, your own president, and other speakers. It just seems to me like all the big guns have gone off, and now we haven't anything left but a few echoes.

The subject I am supposed to discuss, "The County Agent and the Farm Bureau," indicates to me one of co-operation. And I believe that is as it should be. It seems to me the county agent as a representative of the Extension Service and the County Farm Bureau is right out on the firing line where all of these problems that these men have talked about this afternoon have got to be solved. It is their function to talk about big problems, things that face all of us, but we are never going to get anywhere until the man right back in the individual county on his farm realizes that he has got to have a part in solving the things we heard about this afternoon.

It seems to me that there are just about four things that the Extension Agent, County Agent and the Farm Bureau are trying to do. What we are all looking for and trying to bring about is a contented, prosperous family on every farm. That, after all, is our ultimate objective, and we can sum up, it seems to me, the things we have got to do to bring about that objective; we can sum it up under four heads. Organization is certainly one of them. Co-operation

is another. Economical production is next, and also legislation. They are about the four things we have to consider.

I have had a lot of people tell me that we talk too much about production. I believe we do. I heard a man say over here a minute ago that we don't want to hear anything about growing two blades of grass where one grew before, and I have heard the Extension Service is blamed for the over-production of farm crops that we have now. If the Extension Service could take credit for that, I believe it would be the finest compliment that could be paid any agency. I don't believe we can take all the credit for this over-production that we have on hand.

I just would like to ask you what would become of the farmer today, what has become of the farmer today who is only growing twelve bushels of wheat per acre, whose cows only average 3,000 pounds of milk, whose hens are only laying 75 eggs in a year. Those fellows are certainly up against it. So we are always going to have, it seems to me, this matter of economical production facing us. That is something that has to be solved by the Extension Service the best way they can. The best way they can solve it is by working through some such organization as the Farm Bureau.

I believe the time has come when a County Agent in a county must reach more people and he can't do it by calling on individuals. He must work through organizations, and certainly the logical organization for the County Agent to work through is the Farm Bureau. We are past the time when the County Agent was a chicken doctor, a tree doctor, and everybody who had a sick chicken called him up to come out and see an ailing hen or an ailing tree.

I will just illustrate that by something that happened to me. Every Sunday afternoon as religiously, or maybe more so, as I go to church on Sunday morning, I take a nap. One Sunday afternoon just as I was nicely settled, my wife came up and said there was a man downstairs who wanted to see me. I asked her what he wanted, and she

said that he had some sick chickens. I happened to know the man, and knew that he didn't have more than thirty or forty chickens altogether, and she told me only two had died. I said, "You tell him I can't come down this afternoon, but tomorrow morning I will call him up."

That man got highly indignant, and said he was going to the County Commissioners and find out why he couldn't get service. That is the thing we have to get away from, this little individual service that really doesn't mean a thing in dollars and cents, and work through groups and reach more people. Certainly, you people are all sold on the value of organization. If you weren't, you wouldn't be here. So it is not necessary, it seems to me, to discuss the value of organization to you.

Legislation has been mentioned and that is certainly important. There must be something done about the tax problem. You can't get anything done in legislation unless you are organized. I am sure we all realize that. And yet I would just like to say a word of warning, possibly. It seems to me that in our county, and maybe it is so in other counties, that we are staking our all in the Farm Bureau on legislation and the results we can get through legislation. I don't believe that is a wise policy. Certainly, we want to put every effort we possibly can toward getting this tax problem solved; toward getting other beneficial legislation for agriculture; but if we are going to stake our all on legislation, you know that works slowly, it is hard to get, and sometimes the results to the individual seem very small.

And so I would urge especially that out in local Farm Bureaus and our county organizations also that you build up a program more varied than only legislation. I think that is important, but I do believe that local Farm Bureaus working with the Extension Service, County Agent, can put on meetings, discussing economical production.

We must have better dairy cows, use better seed, better farm management methods. We have thought but very

little about farm economics. There are lots of things we have to solve yet. But I think along with our legislative program, especially in the Farm Bureau locals, a program of that kind should be built up, because that is going to affect every individual. He can see the results of it. I believe we are going to be better off in the end.

So, if any one would ask me how far should the County Agent go in co-operation with the Farm Bureau, I would say he should go the limit. It seems to me that there is everything to gain and nothing to lose. Certainly it is a spirit of co-operation and understanding we have here in this State. The Farm Bureau is a solid rock to which the County Agent can anchor in these turbulent times, and I believe that the Farm Bureau, the County Agent, and the Extension Service, working hand in hand, we can certainly make more rapid progress to the ultimate goal that we all have in mind—happy, prosperous families on every farm. (Applause).

CHAIRMAN MASSEY: If you noticed, the next subject is just the oposite of the one we have just heard. It is "The Farm Bureau and the County Agent," and will be discussed by Mr. G. B. Reiman, Secretary-Treasurer of the Talbot County Farm Bureau. (Applause.)

MR. G. B. REIMAN: Mr. Chairman, fellow members and visitors: When I received a letter from Mr. Payne telling me that he was putting me on the program to make a ten-minute talk this afternoon, I felt like I would like to stay away from the meeting. But I realized that every member must do his part when called on in any way, if we are to make this organization what it should be, so here I am in my first experience of this kind. To me this will be the longest ten minutes of this whole convention, and it may be the same to you folks.

My subject, "The Farm Bureau and the County Agent," gives me the opportunity of giving due credit to Mr. R. S. Brown, our County Agent, which he so richly deserves. We

depend on him so often for his efficient help that we have come to feel that he is a part of our organization. His service to the farmers of our county is indispensible, and I do not know how our Farm Bureau could ever attempt to render a similar service unless our membership was ten times as large.

I have spoken to a number of our former members about rejoining the organization at various times, and they have said to me, "Oh, I belonged to the Farm Bureau for three or four years, and I don't see where it has done anything."

Some years ago a visiting preacher was invited to serve in a church in our county. The Sunday morning he entered the church to deliver his sermon, accompanied by one of his sons, a litle boy of eight years, the preacher stopped at the box that was placed near the door for the donations of the parishioners, reached in his pocket, and deposited a dollar bill. After the service one of the deacons of the church told him that it was customary to give the contents of this box to the visiting preacher. When the box was emptied, it proved to hold only the dollar bill which he had put in. His little boy spoke up and said, "Father, if you had put more in, you would have taken more out."

I asked the farmers what they had done while they were members. When they replied that they had not done anything, I said, "Well, when you say that the Farm Bureau has not done anything, you are talking about yourself, as you were a part of the organization."

Your officers are not the Farm Bureau; they are your employes, to carry out your wishes, and if they do not have anything to do, it is mainly your own fault, for you are the ones to see that they do have something to do.

I remember one person in particular whom I went to about his membership dues. He said he had been a member for six years, and did not see any use in being one any longer, as the farmers would not stick together in any

organization. He asked me how many members we had in our county, and when I told him that we had about 175, that many of them belonging to the Farm Bureau, he said that we had about 1,000 farmers in our county, and that if 75 per cent. of them belonged to the Farm Bureau, he would join again. I asked him how in the world we were ever going to get 75 per cent. of the farmers in the county to belong to the organization if they all thought as he did. Where would we make the start if all felt as he seemed to. I also said that if we had 75 per cent. of the farmers in the organization, it would not make a great deal of difference whether he was a member or not.

Some people seem to have the idea that we are soliciting some donation when we approach them regarding being a member. They seem to think that all they have to do is to pay $10 a year, and the Farm Bureau will perform miracles. Our hard job is to make them realize that all the members are the Farm Bureau, and not a few who have been chosen as officers.

Friends, when we all realize that we are part of the organization, and each one must take an active part, then we will be on the right road. Don't think that you can pay $10 per year and then sit back and wait for prosperity to come knocking at your door. I know some of our members who have done good work and will keep on doing good work; some have felt that they are tired of working and the other fellow sitting back and doing nothing, but still reaping the benefits of the organization. Friends, this will keep on happening, as there are people of both kinds every place in this world.

Now, take this convention and the wonderful talks we will all hear. The ones who attend are good members and will be benefited by attending, but the ones who do not attend are the ones who need the inspiration we get here. Our problem is to carry this inspiration back home, and

use our best efforts to instill it into the minds of the stay-at-homes.

Let us all go home with the firm determination that we will talk Farm Bureau morning, noon, and night to those non-members, for you know water will wear away stone in time. If every member would resolve to get one new member each year, just see what the result would be. It looks like most any one could get one member in twelve months. I am giving my time to Farm Bureau work because I believe in it, have faith in it, and am sure that only through organization will agriculture regain the ground that it has lost because of the lack of organization. I am sure that the Farm Bureau of all organizations, is built on as solid a foundation as the organization of industry and labor. I promise you that I shall continue to learn all that I can as to the important functionings of my organization, and such knowledge that I shall acquire, it will be my purpose that my non-Farm Bureau neighbor shall learn of it. If we understand and talk Farm Bureau, one membership a year will be easy for any member to secure.

CHAIRMAN MASSEY: At this time are there any resolutions to be handed in to the Resolutions Committee?

If there is nothing else, we will stand adjourned.

The meeting adjourned at five o'clock.

WEDNESDAY EVENING

More than one thousand Farm Bureau men and women packed the large ballroom in the Lord Baltimore Hotel to witness the final stages of the first State-wide Beauty Contest. Miss Catherine Elise Cleveland of the Cotton Textile Institute of America, proved a most capable manager, and it seemed that each of the contestants was gowned in a costume that was especially made for her. The program of the evening started at 7.00 when the following counties competed for the opportunity of contesting their right to

the banner to be awarded the following evening: Kent, Talbot, Baltimore, Carroll, Harford and Frederick. Kent and Baltimore counties proved the winners.

Immediately following the contest, the beauty contestants, who were being entertained at a dinner so giving the three judges who were Thomas Corner, Mrs. Norman Warfield, and Miss Eleanor Howe, opportunity for further consideration as to whom they would select, made their entrance and the contest was on. All of the contestants had been roundly applauded as they made their appearance, and the contest was brought to a close when the president and the young lady from each county started a grand march which ended with the beginning of one of the best dances ever held in the Lord Baltimore ballroom.

THURSDAY AFTERNOON

January 7, 1932

The Second Session convened at two-thirty o'clock, President Davis presiding.

PRESIDENT DAVIS: It is a great pleasure to me to introduce to you this afternoon as your presiding officer, a man who really needs no introduction in this State I know, but it is a formality we have to go through anyway. We had him out in Chicago a few years ago and somebody said to me, "That Mr. Cockey is just an ideal Maryland gentleman." So I want to introduce to you Mr. Charles T. Cockey, Jr., of Baltimore county.

CHAIRMAN COCKEY: Ladies and gentlemen, fellow Farm Bureau members: It is a real pleasure that I am permitted to preside at this meeting, something far beyond any hopes I ever had in my life. I hope that as this is my maiden attempt, that if I get embarrassed like Tom Parran

did yesterday, you won't notice it. We have always thought in our State organization that our President, Mr. Davis, was a Scotchman. But from the way he can pile on the blarney, he certainly must be an Irishman.

We are a little behind our schedule, so we will start right in with the program. As the first speaker on the program, I will present to you the master of the State Grange, Mr. Ensor, who will bring us a message from the Maryland State Grange.

MR. A. G. ENSOR: Mr. Chairman, Mr. President, Mr. Winder, Farm Bureau members and friends : The reason I feel very much at home, as you all know, in both places, the Grange and the Farm Bureau, is because it happens to be my honor to hold the secretaryship in one of our counties in the Farm Bureau.

It has always been a great privilege to me to work with any farm organization. I think it is one of the things that we get pleasure out of, the longer we work with it. Mr. Chairman, I want to take the opportunity at this time to congratulate you on the attendance that you have had for your annual Farm Bureau conventions, and especially this year. It has been my privilege to attend every Farm Bureau convention that has been held since the Farm Bureau was organized in this State, and I don't think it has ever been my privilege to attend a Farm Bureau convention in this State where there has been shown as much interest both in the meetings and by attendance. So that speaks mighty well for the Farm Bureau organization of this State.

My job here is not to make a speech. I told Mr. Payne when he wrote to me and told me he wanted me to appear on the program and bring greetings from the Maryland State Grange, I would be glad to do it, but I felt they had many other questions, and I did not care to occupy very much of the time on the program. I told Mr. Davis I would

be very glad to get up and say hello anyway, and tell you that we certainly appreciate the work the Farm Bureau is doing in this State.

It has been said on some occasions that perhaps we didn't need the Grange or we didn't need the Farm Bureau. I certainly am of the opinion that we need both of them, and I am sorry to say both of them are not much stronger than they are today. Your secretary made a report yesterday showing I think, somewhere around 2,200 members in our State Farm Bureau. Friends, I would much prefer to see it if it was 22,000. We do not have such membership in our Maryland State Grange.

I think we ought to congratulate ourselves on the progress that our farm organizations are making today, not only in our own State, but in all the States, both from a State standpoint and from a national standpoint. I think it is the first time in the history of organization that the various leaders and the various organizations have been able to sit around a table and discuss the various problems that are before agriculture today and practically agree unanimously on the various legislative questions that are before this nation today. I feel that if our organization does not do anything else but bring together the various groups of this country, they certainly will have done a wonderful job.

I know that there has been some difference in regard to our national legislation between the Grange and the Farm Bureau. I am happy to say at our convention at Madison, Wisconsin, just a few months ago, in November, a vote was taken at that convention instructing the executive committee of that National Grange to unite and co-operate with other farm organizations, and to try to bring in a unanimous program.

I was just told by your national secretary that it was his privilege yesterday to sit around the table with the executive committee of our National Grange, and they have agreed unanimously on six major legislative needs in the

program and policy of this nation. Folks, I think that is remarkable.

So, I wish at this time to say to you again that I am happy to be here as a Granger, and I greet you as a member of the Farm Bureau. It has been my privilege to work with your secretary and with the president of your Farm Bureau for six years, and we have never yet disagreed on questions in regard to the two organizations. I hope that we will always have co-operation between the two organizations. There are plenty of problems that we both have to solve. We should work in harmony with each other, and there is no question in the world in my mind but that the problems of the farmers for the next few years are going to be just as serious, if not more so, than they have been heretofore.

There were some questions mentioned, I believe, by your secretary in regard to legislation. I hope the Farm Bureau and the Grange will be able to work one hundred per cent from a legislative standpoint in the coming years. We have been able in the past to do it, and I see no reason why we can't do it in the future. It is one of the biggest questions we have before us today, the taxation question, and it certainly will be a great privilege for me as a representative at Annapolis to do anything that is to the best interest of the farmer.

This is not going to be a very small problem. It is a big question. And when you map out your legislative program, I want to warn you, you may expect a good deal of opposition, and I feel you must be prepared for it. I think, as Mr. Stewart said, that these questions will have to be taken back to your local Farm Bureau meetings, and we likewise in our subordinate granges, start from the bottom and work up to the top, so we will have co-operation back at home in regard to legislative questions at Annapolis.

I want to thank you for this opportunity and wish you God speed for the year 1932. (Applause).

CHAIRMAN COCKEY: Next on the program will be a report of the Credentials Committee. Mr. Weagley, from Washington county, is chairman of that committee.

REPORT OF CREDENTIALS COMMITTEE

Convention—1931

Your Credentials Committee has examined the records submitted by the secretary-treasurer of the Maryland Agricultural Society, The Maryland Farm Bureau Federation and find the following county and affiliated organizations in good standing and recommend in addition to their duly authorized director the seating of delegates as follows:

FOR THE COUNTY FARM BUREAUS

County	Number Mem. Paid	Director	Delegates	Total
Anne Arundel	36	1	1	2
Baltimore	223	1	4	5
Cecil	79	1	2	3
Carroll	120	1	2	3
Caroline	121	1	2	3
Dorchester	40	1	1	2
Frederick	247	1	5	6
Harford	296	1	6	7
Howard	102	1	2	3
Kent	167	1	3	4
Montgomery	146	1	3	4
Queen Anne	106	1	2	3
Talbot	147	1	3	4
Washington	80	1	2	3
Wicomico	135	1	3	4
Worcester	98	1	2	3
Total	2148	16	43	59

FOR THE AFFILIATED ORGANIZATIONS

	Director	Delegates	Total
Md. Stockmen's Association	1	1	2
Md. Beekeepers' Association	1	1	2
Md. Crop Improvement Ass'n	1	1	2
Md. Vegetable Growers' Ass'n	1	1	2
Md. Poultry Association	1	1	2
Md. Tobacco Growers' Ass'n	1	3	4
Md. State Dairymen's Ass'n	1	3	4
Agricultural Corp. of Md.	1	3	4
Md. State Horticultural Society	1	1	2
Total	9	15	24

This will make the convention consist of 59 delegates from the counties and 24 from the federated organizations or a total of 83 delegates, entitled to vote. In addition to this, the president and vice-president and the chairman of the home and community committee of the State Farm Bureau Federation are entitled to vote.

Respectfully submitted,

R. C. F. WEAGLY, Chairman,
G. W. F. INSLEY,
WILBERT SMITH,
R. N. STAGG, JR.

CHAIRMAN COCKEY: The next is the presentation of medals to the vocational agricultural boys by the secretaries of the affiliated associations. Mr. Blackwell will take charge of it.

MR. BLACKWELL: Mr. Chairman, ladies and gentlemen: I have the privilege as well as the honor to present to you this afternoon thirty-six boys representing 1300 boys taking vocational agriculture in 48 high schools of Maryland. These 36 boys here represent 18 of these 48 schools, and they come from nine counties. Due to the fact that five of the winners in this contest are from counties long distances away, they are not here. The boys from the Eastern Shore are not here.

These boys represent the F. F. A. of Maryland. They also represent the 55,000 boys of America who are members throughout the United States. As some of you know, in 1928 a national Association of Future Farmers of America was organized, and soon after that Maryland was granted a charter of Future Farmers of America. Since that time our charters have gradually grown. The first year we had 16, the second year 27, the third year 33, and this year 41. Each of the agricultural teachers in the State is now adviser to at least one chapter. Some of the teachers teach in two schools, and 48 of the schools have chapters at this time. Some of the chapters are unit courses where we have no department, but these boys represent the 41 chapters of F. F. A. in Maryland.

I am sure you realize, looking over these sturdy youngsters, the possibilities of 55,000 boys enrolled in this type of

work throughout the United States. These boys come from Charles county, two from Dorchester county, three from Frederick, one from Middletown, two from Walkersville, five from Garrett, one from Harford, three boys from Howard county, two from Montgomery county, two from Prince George's county, nine from Washington county.

I am sure you realize we are purely democratic in presenting this group of boys to you, because they certainly are representative of the vocational departments throughout the State.

One of the men who is to award the medals today asked if I would take just a moment of your time to tell you the score card upon which these boys are selected. We select them on a basis of ten different points. From the State standpoint we use only eight of those points, however. The first one is the number of months the project is carried on. I am taking it for granted that you know this is a project contest, and these projects are carried on in connection with the agricultural work in the different departments. For each month a boy carries on a project he is granted one point towards the eight. If he carries it on ten months, he is entitled, of course, to ten points the maximum credit. Some of our boys, however, carry on projects throughout the four years of high school work.

We feel that the one big thing we are interested in, is to get these boys started in this vocational work, and then they will go on, and on, and we hope they will become efficient Farm bureau members, the type you represent.

In the second place, for each 25 hours of self labor from one to ten points is given. Third, for each 25 labor income per hour, from one to ten points. Fourth, for each $25 of labor income, and most of you know that is a very difficult item this past year, from one to twenty points. On an exhibit five points; on a winning exhibit, five extra points; on records kept, ten points; on ownership, ten points. We feel that the boys are going to get the greatest amount of

good from carrying on this work of their own accord, owning their projects, and developing them.

In addition to those eight points I have read, two additional points are used by the local teacher. The first is the project supervisor's visit and report, and the second is the attitude of the boys towards their work. That constitutes the score card by which these boys are judged.

I wish I had time to tell you the objects of these boys' working in these different chapters. I am not going to take your time for that. But without further ceremony, I do want to present these boys to you, and in presenting them I want to thank the following organizations for making this contest possible. First of all, the Maryland Farm Bureau, which has sponsored the movement from the beginning, and the Maryland Farm Bureau wool pool. Along with those two organizations we have the Maryland State Dairymen's Association, the Maryland-Virginia Interstate Milk Producers Asssociation, the Maryland Tobacco Growers Association, the Maryland Poultry Growers Asssociation, the Tri-State Packers, and of course, the different agricultural interests throughout the State.

I take pleasure then in presenting what is to me, one of the finest groups of future farmers of America in the United States. (Applause).

WINNERS OF MEDALS

The following is a list of the boys receiving medals, the organization, and representative who presented them:

Organization	Project		Presented By:
Maryland State Dairymen's Association	Calf	Vernon Wehland Donald Anderson Irvin Anderson	I. W. Heaps, Secretary
Maryland-Virginia Milk Producers Association	Calf	Oliver Watkins George Stauffer Edward Poole	John McGill, Jr., Secretary-Treasurer
Interstate Milk Producers Association	Calf	Charles Wyand Elwood Athey Roger Stouffer	A. R. Marvel
Maryland Stockmen's Association	Baby Beef	Robert Stine William Scott Wilburn Beuhl	B. E. Carmichael, Secretary-Treasurer
Maryland Stockmen's Association	Swine	Leon Howard Joseph Geisinger John Crabtree	B. E. Carmichael, Secretary-Treasurer
Maryland Crop Improvement Association	Potato	William Hauser Grant Hardesty Boyd Hardesty	F. W. Oldenburg
Maryland Farm Bureau Wool Pool	Sheep	Robert Winders Lewis Ahalt Oliver Fike	James W. Davis, Pres. Md. Farm Bureau
Maryland State Poultry Association	Poultry	Lareine Winders Kenneth Frey Harold Reynolds	F. M. Payne, Sec., Md. Farm Bureau
Maryland Crop Improvement Association	Corn	Elsworth King Clarence Rulshart John Burdette	F. W. Oldenburg
Tri-State Packers' Association	Sweet Corn	Herman Shockey Meredith Poole Hanford Cook	F. Hall Wrightson
Maryland Tobacco Growers' Association	Tobacco	Bennie Huntington J. Wilson Turner Ernest Garner	Louis P. Ranft
Tri-State Packers' Association	Tomato	Robert Medford Leon Medford Francis Miller William Chilcoat	F. Hall Wrightson President
Maryland Farm Bureau Federation To Champion 4-H Judging Team		James Johnston Charles Clark	H. M. Carroll

4-H CLUB AWARD

H. M. CARROLL

Immediately following the presentation of the educational medals, President James W. Davis introduced H. M. Carroll, who coached the team of 4-H Club judges who competed abroad for the International Trophy. Mr. Carroll, after expressing his appreciation of the co-operation of the Maryland Farm Bureau Federation in donating the medals, made the following remarks:

"The fact that only about three minutes ago Mr. Payne informed me that I was to have the privilege of presenting these medals, brought to mind the old axiom, 'Some men are born great, some acquire greatness, and some have greatness thrust upon them.' The speaker will naturally fall in the last classification.

"It would be unnecessary to state to an audience of this kind just what 4-H Club work in Maryland is and what it stands for. You are all fully aware of the outstanding results that are being accomplished among the farm boys and girls throughout the State through the medium of the 4-H Clubs. You might be interested to know, however, that there are 3,600 4-H Club boys in Maryland, and a total enrollment of over 860,000 4-H boys and girls in the United States.

"Last year the Maryland 4-H Club dairy cattle judging team went to England, defeated the Irish and English in the international judging contest and brought the championship gold cup back to the United States. The privilege of representing the United States in this international contest was granted to the Maryland judging team by virtue of their winning the State contest, and also the national contest in St. Louis in the fall of 1930.

"I wish to state that the Maryland Farm Bureau helped to make this European trip possible, and stands ready to co-operate with and assist the 4-H Club movement wherever possible. It is with great pleasure, then, that I have the

honor of presenting these medals to the members of the Maryland 4-H judging team.

CHAIRMAN COCKEY: It is now my pleasure to introduce to you Mr. M. S. Winder, executive secretary of the American Farm Bureau Federation, who will now address us.

MR. M. S. WINDER: My good friends of the Maryland Farm Bureau: I do feel that it is something of an accomplishment in that your presiding officers have invited me to come three years out of four to take part in the annual meeting of the Maryland Farm Bureau Federation.

I have been tremendously pleased in observing the proceedings thus far to find them quite free of discussions of adversity and depression and calamity and all of the other dire things that people have been experiencing. With regard to the depression and the distress that we have suffered, I am wondering if it is not to a great extent a result of hysteria and fear that people have felt. Surely, this country is abundantly rich in its natural resources. There is unlimited opportunity for us to make a very satisfactory living, and were it not for the things that have occurred in the minds of men causing them to fear for the future, I believe that all would have continued to be well with the people of this country.

Unfortunately, to be sure, the prices of farm commodities have been out of line with the prices of other commodities, thereby reducing the income of the farm folks and depriving other industries and business groups of the best market that they have enjoyed in times past, the farm market.

Speaking of the fear that has existed in the hearts of men, I am reminded of the story that comes out of the far east that might not be inappropriate here. The old patriarch sat grieving over the distress that was abroad in the land and the troubles of his people. The angel of the Lord came there to him and said, "I have been sent to take 10,000 of the people of this city, because it is the will of Allah that it shall be done." And the patriarch mourned.

The angel of death went into the city, and presently the patriarch heard the sounds of deep mourning and of distress and despair coming from within the city, and he mourned still more. As morning came, the angel of death came back and paused in the gateway. The patriarch looked up and said, "Allah's will be done. How many of my people have you stricken with death this night?"

The angel said, "Thirty thousand have died in the night in your city alone."

The patriarch said, "And yet, you promised me that it was the will of Allah that only 10,000 should be taken."

The angel replied, "It was Allah's will that 10,000 should be taken. The other 20,000 died because of fear."

I am wondering if we can't make an application of that story in our own lives, and in our business experience, because nothing is more deadening to the business of the community than a sense of fear, or a condition of hysteria. The farm people of this country during these past several years have not enjoyed a fair share of the national income, and during that period we have felt that compared with other groups we have had much to cause us distress. And yet, today, I feel that in comparison with other people, we farmers have a great deal to be thankful for.

As I go about through the country I find that farm folks do have plenty of good food to eat. We have comfortable homes to live in for the most part. It is true that in many instances our taxes are not being paid, we are unable to pay the interest on the money that we have borrowed, we are in distress in this respect; but oh, when compared with conditions obtaining in our great cities, how blessed we farm folks actually are.

Because the general offices of the American Farm Bureau are located in the City of Chicago, it is necessary for us who are employed by the Federation to maintain our homes there, and in our city at the present time it is reported that it is necessary that there be raised $23,000,000 in order to sustain the lives of the people who are unemployed. At this

time there are 120,000 families who have no member of those families gainfully employed, and there are a total of almost one million people in the State of Illinois alone that are out of work and have no means of support. If you could see as I have seen, bread lines running for blocks on each side of the dispensaries, you would realize what a desperate plight the unemployed people of the cities are in.

And so I repeat, that as compared to the situation in which these folks are placed, we farmers are not so bad off and we still have much to be thankful for. I am not contending at all that our condition is satisfactory, oh far from that. But at least, we are going to be able for the most part to weather the storm, and presently we, when business is restored to normal, will have succeeded in securing the things to which we are entitled, and will be in a favorable position to go on and continue to operate successfully.

I am going to take the rather limited time that is placed at my disposal to discuss with you a few of the fundamentals included in the program of the American Farm Bureau Federation. First of all, I would like to discuss the need for a change in the American land policy. For years and years, in fact, during almost the entire time of the history of America, our land policy has been one of expansion. Efforts have been made to provide cheap new land for all who would go out and occupy this land. And as the land frontier was reached, we have found that it was even necessary to go into expensive irrigation operations and extravagant reclamation in order to provide still more land for those who would like to possess it.

This was a sound policy during the years that America was being settled, but today we are confronted with a situation where we find that vast areas of land are being cultivated, that the best farmer in the State of Maryland or any other place in the United States could not cultivate profitably even under favorable conditions. A great wrong has been done in inviting people to take possession of sub-

merged land and endeavoring to wrest therefrom a meagre living. And yet, the policy of our government has been to continue with further reclamation projects at the very time when farmers can't secure the cost of production in old established agricultural communities.

It so happens that I spent most of my years in the arid west where farming is possible only through irrigation, and I know positively that the farmers who went into it were in the early days the ones who took up all of the land that was readily accessible to irrigation, that it is only in recent years that the extravagance of Federal reclamation has been required. And I know this, that on a great majority of the Federal reclamation projects, people have gone in with high hopes expecting to make homes and farms for themselves, and have found that the cost of maintaining their developments has been so great that it has been impossible to continue there on a prosperous basis. There is nothing more tragic than to go into some of those old reclamation projects that were started about the time of the World War, places where soldiers were invited to come and take up homesteads, and where they struggled with might and with main for a few years, until every dollar they could raise was expended, and then because they couldn't carry on any further were forced to abandon their homesteads.

I have spent considerable time driving through these very projects and seeing the deserted homesteads of those who attempted to reclaim land in districts where the job just couldn't be done by any reasonable means.

I was very much interested in reading a few days ago of an action taken by the California State Chamber of Commerce in which this important body denounced any further efforts at reclamation until the time arrives when there is a distinct need for increasing the production of agricultural commodities in this country. And yet, at Washington yesterday I met a lobby that represents a group in the northwest that are demanding the greatest expenditure for Federal reclamation that has ever been considered in this

country, and that would bring into production literally hundreds of thousands of acres of land.

The time is at hand when the farmers of the east and of the middle west and of the south must unite with the dirt farmers of the west in insisting that no more money be spent to bring in new land until the lands already under cultivation can be farmed profitably. (Applause). And then I would go one step further. Let us begin to map out a consistent program whereby unprofitable land can be taken out of cultivation. As one means whereby this might be accomplished, let me suggest that we secure the enactment of law in our various States which will provide that when a farmer desires to retire a tract of land from cultivation with the object of putting that land into forest trees, that that area shall be exempt from taxation until such time as a crop of timber is produced, and that the taxes then be collected on the timber that is produced rather than on the acreage involved.

More than that, it would be a very proper thing for the forestry departments of the various States to make available seedlings that could be planted on these tracts of land, and for which the farmers would not be required to pay until those trees had grown to maturity and the first crop of timber was removed. By this means alone it should be possible to take out of production considerable areas of submarginal land in every State of the Union. Timber is one crop of which we need have no fear of an immediate over production.

Last year the destruction of timber, either through use or the destruction by fire, amounted to four times as much as the new timber brought into bearing. The amount destroyed last year, either through use or fire, was as great as the combined total areas of the States of Ohio and Indiana. If we go on at the present rate, it will be only a generation before the timber resources of this country will be completely used.

It seems, then, that a perfectly sound practice would be to put submarginal lands to use in growing trees in order that future generations will be provided for. Inasmuch as it would be necessary to exempt these areas from taxation, it is probable that a reorganization of local taxing systems may be necessary, but this might perhaps be very beneficial, as it is probable that we could consolidate some of our smaller units of government without disastrous effect even under present circumstances. I know in the county in which I live, there are more than 400 individual taxing units which levy and assess taxes upon the people when I am convinced that three or four at the most could do the job much more effectively and economically than can the vast number now operating.

If the federal and state governments are required to give some assistance in putting into effect this new land policy, let them give this assistance, inasmuch as it has been largely through federal and State direction that the present too great area has come into production.

Without giving more attention to this phase of our program, let me commend it to your serious consideration, believing that it deserves the careful study of farm people in every community.

Then there is the tremendously important matter of taxation. Taxes have mounted up, and up, and up until today in many communities we find the people no longer able to pay the amount required. I am not contending that public officials are corrupt. I am not contending that they have wantonly engaged in extravagance, because for the most part, the public officials have spent money as we have demanded they spend it. Too often well organized minorities have demanded the expenditure of unwarranted sums, and because the majority and those who pay the heavy taxes have not been at hand to protest, these sums have been authorized and spent.

Last February the American Farm Bureau took the responsibility for calling a conference of thirteen national

groups to discuss the subject of taxation. We invited into that conference representatives of the American Federation of Labor, of the General Federation of Women's Clubs, of the American Bankers Association, the National Association of Real Estate Boards, and so on through the entire list of important national groups. And they very kindly responded to our call, and for two days the representatives of these great national organizations discussed the subject of taxation.

Out of it all came two important conclusions. The first conclusion was that all tangible property bears a tax load that is entirely too heavy, and that a fair basis upon which taxes must be levied and collected is the basis of ability to pay, and not the ownership of property.

The second conclusion reached was that a greater degree of tax consciousness must be aroused through insisting upon every person in every community who enjoys some income being required to pay part of the taxes.

Well, we have made great progress when we can get all of the national groups to agree on those two great fundamentals in taxation. In the past I feel that too often we farmers have made a mistake in considering the matter of taxes, by taking the position that agriculture was especially discriminated against. Facts reveal that agriculture and those who own homes and business properties, the owners of real estate and industrial properties alike bear a burden of taxation that is almost impossible to stand. We farmers must not engage in special pleading, but unite with the owners of all other tangible property to the point where together we insist that every one who enjoys the benefit of government pay for the benefits received according to ability to pay.

As we invite the co-operation of other groups in promoting such a program, we are going to make great progress in reaching a solution of the vexing tax problem. All over the country, particularly in rural districts, banks have failed. The credit facilities that farmers have enjoyed are

being denied them because banks have gone out of existence, and because in other instances fear has clutched the hearts of those who manage these institutions.

A number of years ago there were established the Federal Land Banks and the intermediate credit banks. The act under which these banks were established is fundamentally sound. We do believe, though, that the act has not had the sympathetic administration to which the farmers have been entitled in order that the Federal Land Banks fulfill the purpose for which they were created. Their administration should be fully sympathetic to the needs and desires of agriculture. And they haven't been in the past. We are demanding that these institutions render the service for which they were set up.

We would like to commend to your consideration the possibilities for local financing that are contained within the co-operative credit unions in the States of Ohio and Indiana. The Farm Bureau is taking the lead in setting up co-operative credit unions for the purpose of providing for the credit needs of the farmers during periods when they require only temporary or seasonal loans. These institutions when properly set up render an invaluable service, and are worthy of the consideration of every farm group.

Discussing this matter of credit, I would like to quote just one paragraph from a recent statement of one of America's greatest statesmen, Frank O. Lowden. Governor Lowden says: "We have gone insane in this country, in our banking operations upon the subject of liquid assets. Liquidity and mobility are the two chief characteristics of the present day. The bank examiners insist upon banks throughout the country having nothing but what they call liquid assets. I remember very well that when the Federal Reserve System was devised, the fundamental principle upon which that system was founded was that commercial paper representing goods in the intermediate stages between production and consumption were liquid assets, because they liquidate themselves. That was the theory of

the Federal Reserve System. And the issue of currency was based upon this paper.

"Today, however, the banking authorities regard call bonds, which are the very opposite of quick assets, as understood when the Federal Reserve System was adopted, more liquid than paper representing cattle, or hogs, or crops, or almost anything else. And so the banks have been driven to withdraw their investments from the farmers and the small trades people to invest in bonds. These bonds, by the way, were largely floated by the great banking houses of New York. Our bankers tell me that they have lost more money on bonds which they have been compelled to buy than they have on all the loans they have ever made to farmers."

I hope you note that statement. The bankers admit they have lost more money on the bonds which they have been compelled to buy than they have on all the loans they have ever made to farmers. "Bonds of many foreign countries are quoted today at only a small portion of the purchase price. They are selling now for something more than the commissions which these banking houses received when the bonds were first offered for sale. And yet, those bonds have been approved by our bank examiners in preference to loans to farmers for legitimate purposes.

"One of the most prominent bankers in Illinois says that the prejudice against farm loans is so great that one national bank examiner insisted on his having a chattel mortgage if he made a loan to a farmer to buy cows or other live stock, or he would not count the loan as an asset of the bank, and then when this man went to the Federal Reserve Bank they would not discount the paper secured by the chattel mortgage because that was against the law."

This statement of Governor Lowden's is significant because it shows the trend in which the financial leaders of this country have been thinking. In former years, land was regarded as the greatest asset that any man could own. I remember my venerable grandfather advised me as a youth

to buy all the land that I could possibly secure, and yet, today if I want to borrow money, using that land as security, I am greeted with the statement that land is not a liquid asset and therefore, is not eligible as the basis for a loan.

I would like to call to your attention the fact that in all ages of the world the ownership of fertile land has been the priceless possession of the nations of the earth. Those of you who have read ancient history recall that wars were fought through hundreds of years in order that nations might possess the fertile reaches of the delta of the Nile. The mere fact that Rome owned this Nile delta probably prolonged the life of the Roman Empire by at least a hundred years. Well, in the delta of the Nile there are about ten thousand square miles of good land, and yet, over in the delta region of the Mississippi valley we have ten times as much good land as ever was located in the delta of the Nile. And yet, people are wondering today if land has any tangible value.

It is time, folks, that the leaders of this country get back to straight thinking and to fundamental principles in weighing the values of things that exist. Stocks and bonds are all very well. I am not complaining about those who desire to invest in these securities. But stocks and bonds will not feed nor clothe the world. And yet, the products of the land will sustain life for generations through all time to come.

Well, I believe sincerely enough in what I am telling you folks that this year I went out and bought me another farm, and if Providence will be kind, I hope some day to get it paid for, and I hope I will live to see the time when I will feel that I did a wise thing in acquiring more farm land in the worst year that agriculture in this country has ever known. Incidentally, I would be ashamed to tell you the price I paid for it, for you would think I was taking deliberate advantage of my neighbors.

In visiting various parts of the country I have observed a movement on foot to reduce the cost of government. This,

I believe, is absolutely sound, and must be followed up. But I appeal to you to observe carefully the direction in which efforts travel to reduce the cost of government. I was in a community very recently in which it was proposed to reduce the cost of government by eliminating the employment of a county agent and the home demonstration agent. There never has been a time when the farmers of this country so seriously need the advice and the counsel of trained people as at the present time. Let us weigh carefully any proposal to reduce the cost of government by attacking those services that are of fundamental importance in the lives of farm people. Surely, government can be reduced by other means than depriving us of services that are most essential. (Applause).

One of the most reliable political writers of America has recently published a series of articles having to do with government in business, and it was a matter of distress to me to read his articles and find that he spoke of the great paternalistic schemes of the Department of Agriculture. He went on to say that the Department of Agriculture spent a third of a billion dollars annually, the greater portion of it for paternalistic schemes to help out the farmers. And then he gave a list of the expenditures, and I discovered that the biggest item of all, one that made up for more than half of the total, was for the Bureau of Public Roads, the amount of Federal aid that is distributed for public roads.

I recall that by far the greater part of Federal aid for public roads is expended on the primary systems for building of beautiful highways between the important cities of the country. And yet, they go ahead and charge that up to the farmers! I would be perfectly willing to take the charge if only they had been honest and provided that that money should be spent for farm to market roads to get all the farmers of the country out of the mud! (Applause).

So much is said of this matter of "getting the Government out of business", and unfortunately, most of the criticism is directed at governmental services to agriculture.

If the Government will get out of business in every line of endeavor from start to finish, we farmers will take our loss along with the rest and not offer one word of complaint. The Government is giving more assistance to commerce and to industry today than it is to agriculture, and yet, we are made the goat in most of the articles that are published and most of the speeches that are delivered with regard to the Government being in business.

It is time for the American people to be clearly informed on this subject, and then to let the light of information direct the course that we are to follow. We are not asking for special privileges, but if this is to be a protected nation in which certain groups are to receive high privileges, we demand that agriculture receive its fair share of the privileges to be distributed. (Applause).

It has been a common thing in the past when representatives of your organization or of the Grange have gone to Washington to ask for necessary legislation, to be met with the statement that the farmers are not united, that we are divided, and are following different schools of thought. Mr. Ensor in his greeting to you called attention to the fact that there is in the City of Washington today, and the conference was in session yesterday, a conference of the farm organizations in which leaders of the American Farm Bureau and of the National Grange are sitting down in conference together to agree on all the fundamental principles for the promotion of the welfare of agriculture, and I am exceedingly happy to tell you that these two great institutions find that in all matters of major importance, there is no difference in our thinking.

This year we are going to present in the Capitol in Washington, and in the capitals of our various States, a united front such as agriculture has never before been able to bring. Let no one delude you into thinking that the farm organizations are at war between themselves. Any leader who dares to attack a reputable farm organization is not worthy of the leadership which is bestowed upon him.

Mr. Ensor declared that he believed there was a place and is a place for the Grange and for the Farm Bureau. Yes, my friends, there is a place for each of these institutions, and there is a place for every legitimate co-operative enterprise in the interests of agriculture that has been established in this country. We must have general farm organizations, but if the business interests of the farmers are to be protected and promoted, there must be well managed, properly financed, and adequately manned co-operative associations through which the products of the farm can be placed in the consuming markets under the most favorable circumstances.

During all the history of the American Farm Bureau it has stood as a staunch advocate of co-operative enterprise and the development of co-operative marketing.

In conclusion, let me call to your attention the vast scope and size of the organization of which you are a part. I feel exceedingly humble in speaking to you of your national organization, and in standing before you as its accredited representative. I feel that a great responsibility falls upon any man who undertakes to speak for hundreds of thousands of farm families. The Farm Bureau as constituted at the present time is made up of 43 State Organizations, all but three of which are properly manned and equipped and are doing very creditable business. Three of them exist with small memberships, but with high hopes of future development. These 43 make up the membership of the American Farm Bureau Federation, and in point of membership they go all the way from the few hundred that we find in some of our small States to the 72,000 families in the great State of Iowa, that make up the membership of the Farm Bureau.

There were 184,000 county farm bureaus organized and functioning at the end of the past year. There are about 16,050 community or township units holding meetings, transacting business, and carrying on educational projects. There are 5,984 men and women giving their full time to

the work of the organization in county, state, and national units of the Farm Bureau, a whole regiment of people devoting their full time, thought, and attention to promoting the interests of the organization.

The total business carried on last year by farm bureau service organizations and the organizations directly supported by the Farm Bureau in buying and selling of commodities was $490,000,000, and I am not including in that statement the great co-operatives with which we have very sympathetic relations but no direct tieup, $490,000,000 worth of business conducted under the patronage and with the support of the Farm Bureau organization.

In the field of co-operative insurance, the farm bureaus throughout America have provided adequate automobile insurance at farm risk rates for 534,000 automobile owners. In the field of co-operative life insurance, farm bureau units have provided life insurance under the most desirable conditions for a large number of policy holders, insurance in force at this time being approximately $90,000,000.

We have just begun in these enterprises. We are beginning to realize the service that the organization can render when unitedly we undertake to do the things that individually we cannot hope to accomplish. The total cost of operating and sustaining the Farm Bureau is a staggering figure. We have expended, and this money has been secured through the membership dues of the members, $10,694,851 and every dollar of that has been expended in providing service and in conducting the business activities of the Farm Bureau organization for and in behalf of the membership. We believe that we are today better equipped to go forward with our program than we have been at any time since the first county farm bureau was organized nearly 21 years ago over in the State of New York.

There is only one limiting factor in the successful prosecution of this entire program, and that limiting factor is the fact that we do not have enough farm men and women allied with the organization. Let me give to each one of

you present here today this earnest charge. Will you go back into your communities, will you develop there membership campaigns wherein every worth-while farmer in the community can be invited to join the organization? If we will go forward with a spirit of invitation, asking the support of the farmers of the community, I am sure that we can swell our ranks to the point where the future of agriculture in America will be assured through organization and co-operative effort. (Applause).

CHAIRMAN MASSEY: The next gentleman I will introduce to you, you had the pleasure of hearing two years ago, and I am very glad indeed for your sake that this gentleman has consented to come back here today. Mr. C. B. Denman, member of the Federal Farm Board, livestock divsion, will address you.

A NEW EPOCH IN AGRICULTURE

C. B. DENHAM, Federal Farm Board.

Greetings to Friends of Agriculture

It is with genuine pleasure I greet the members of Maryland's co-operative farm groups on this occasion. I appreciate fully the thorough-going interests your organizations have manifested in the support of co-operative marketing of farm products and the efforts you have put forth to advance the welfare of your farmers. It is always heartening to know that farmers are willing and ready to band together for their mutual benefit. Indeed, it is gratifying to be able to say that today there is much in American agriculture to encourage all farmers who are interested in co-operative marketing to increase their faith in the future.

The ranks of organized agriculture have been reinforced. The advance for greater victories must be pursued. Through a long-sustained depression with financial and commercial wreckage on every hand farmers' business agencies have operated successfully with only a few casualties. Control

of marketing and control of production through organization have made great strides.

Farmers See a Way Out Through Organization

Through the gloom of abnormal economic conditions, both at home and abroad, the forces of national co-operative organization see a way out which impels renewed energy and progress. It has been proceeding cautiously but courageously, ever mindful of the heavy load it had carried subsequent to the deflation period of 1920, and painfully conscious of the disastrous decline of the past two years which hit its ranks with full force, yet with undimmed fortitude it is preparing for a new and surer place in the next decade with the hope of retaining its inherent rights and gaining its own freedom to work out its own destiny. Although tough as the going has been a few bright lights shine upon the economic horizon.

Gains Already Made Add Faith in Ultimate Outcome

Since the creation of the Farm Board substantial advances have been made in organization resulting in greater gains than in the whole previous history of co-operation. The increase in the number of co-operative associations, the larger number of farmers participating in the advantages that come from group action and the value and volume of agricultural commodities handled should give added faith in the ultimate outcome of the agricultural policy laid down by Congress in the Agricultural marketing Act.

This is the long-time program toward which the American farmer aided by the Farm Board has been working so intensively. This development gives the most hopeful and inspiring picture of American agriculture. From individualistic unorganized agriculture, farmers of America have been turning rapidly to organized co-operative agriculture. It is a romance of modern business when farmers working together under adverse conditions can do a total business

in one crop year amounting to $2,400,000,000 with at least 2,000,000 farmers participating. When compared with that of the year before the Farm Board began its operations this volume shows an increase in the business handled co-operatively of 41 per cent for all commodities. Notwithstanding the lower price the actual increase in the value of products marketed by co-operatives was over $100,000,000. Splendid as this is it is merely a start toward complete realization of the program.

Farmers Can and Do Work Together

For many years it has been said that farmers could not and would not work together but if they did co-operate their actions would end in failure. The Agricultural Marketing Act made it possible for the Farm Board to aid farmers in setting up their marketing groups and to assist in financing these organizations until they can stand alone. Until this law went into effect farmers co-operatives were not in all places recognized in the public markets but now they sell in the markets here and abroad effectively and command the respect of processor and consumer of our products. Here is proof that farmers can and are co-operating.

This increasingly large group of farmers in business organizations realize that to the degree that they work together for a common purpose or purposes, they become effective.

Co-operatives Give Efficient Management and Larger Services

But growth in number of farmer memberships in cooperative organizations, increase in volume of business transacted, while substantial evidences of progress are not the only tests of an achievement that farmers have made toward realization of their program. Efficient management and larger services rendered show that farmers can do business on a large scale successfully. When properly supported and encouraged this demonstrated ability on the part of

farmers reveals that they can transact complicated financial activities of modern business efficiently. With the aid of the Farm Board, farmers have established new co-operative organizations and strengthened others already established, and have builded their structure on foundations for permanent stability.

Under the Agricultural Marketing Act the chief trend has been to centralization of co-operative activities from local to regional and national organizations. National co-operative sales agencies have been created by co-operatives to handle the principal farm products, including grain, cotton, livestock, wool and mohair, pecans, beans, fruits and vegetables. Regionals have been established for handling dairy products, poultry products, potatoes and other commodities.

Experience Shows Need of Co-operation by Farmers

The farmer who joins a co-operative farm group is motivated to do so because he wants to preserve his right to manage his own affairs and experience has shown him this cannot be done by continuing to act alone and without regard to what his neighbors are doing. He knows that farming is not only a way of life and making a living but it is a business and that the successful farmer must adopt sound business methods and practices in both production and marketing.

The farmer must make his program pay a profit else he cannot discharge the duties of citizenship which are as binding upon him as they are upon any other business man. He seeks to give his family the same opportunity for education and development as any other citizen of the republic. He is entitled to this and should be given every advantage to achieve it on an equality with those engaged in other industries.

The Farm Is a Factory

The farm is a factory, the producer of raw products. Utilizing the complex process of nature the farm factory creates a new wealth of commodities annually valued on

an average at ten billion dollars. There are some six and one-half million farm unit factories in which the farmers of America have a capital investment of some 58 million dollars. From the income of the operation of these units American farm homes are supported. The community standards are set, schools and the government maintained. It is, therefore, vitally important to the common welfare that the business of this vast capital investment and annual production be carried on efficiently and successfully.

For decades the federal government has aided the farmer in increasing the productivity of our land by supplying him with the needed information. This part of the government's program reveals itself in the legislation leading to the establishment of the Department of Agriculture and its varied activities, the early establishment of Land Grant colleges, experiment stations and extension services. Up to the time of the passage of the Agricultural Marketing Act, the policy of the government was devoted almost entirely to increased and better production with little thought given to the marketing of what the farmer produced.

American Farmers Are Most Efficient In World

As a result of this policy and the government's activities supplemented as it has been by enormous sums from the various States, the government has done a most successful job in helping American farmers to become the most efficient producers of agricultural products in the world. It has spent millions of dollars helping in producing crops and protecting these crops and farm animals from disease and insects and in teaching the farmer how to conserve the soil properly, fertilize his land and to produce new and better varieties of plants and animals.

Only recently farmers are coming to realize that their production must be adjusted to market demands and that their success in the operation of the farm depends as much, if not more, upon orderly marketing than it does on efficient production.

The importance of marketing farm products was recognized by Congress in the passage of the Agricultural Marketing Act. This legislation commits the federal government to a program of co-operative marketing as the method of aiding the farmer to solve his marketing problems. Until 1929 the outstanding objective of the federal government in co-operation with the States was to aid the farmer in increasing production and in providing better roads to his local market where he had little or nothing to say about the price he received for his products.

Objections Arise When Farmers Do Own Marketing

It is a striking fact that all the government's aid to agriculture, including the passage of the Agricultural Marketing Act, has had the general public support irrespective of partisan or sectional interest. Indeed, agriculture has always had a national appeal and its needs have been upheld vigorously by farmers and other business men alike. Serious opposition to efforts of the Farm Board to help farmers build their own marketing machinery did not develop until it became apparent that the national co-operative program was making headway and would perform a real service for producers. Then a howl of indignation arose from certain quarters carrying as their slogan "Take the Government Out of Business." These critics protested that while it is right for the government, State and national, to maintain a Department of Agriculture, to support agricultural colleges, experiment stations, extension services, vocational agriculture, that it is even right to build highways at public expense from the farm to the markets but that it is all wrong for the government to aid farmers in the merchandising of their products to their own advantage.

Critics Forget Government Has Aided and Protected Others

These critics seem to have forgotten that the federal government granted aid to the shipping and American

Merchant Marine interests; it extended assistance to the airplane industry, by air mail contracts which encouraged transportation industry. That the federal government had given support to railroads originally by large grants of land and rights-of-way worth many hundreds of millions of dollars which wealth belonged to the American people. They seem to have overlooked that federal government aid is being given every day to private business through the granting of second class mail privileges while the average citizen pays higher postage on the letters he writes. The automobile industry has benefited greatly from the more than one billion dollars of federal aid given in the past ten years to States for the building of good roads on a fifty-fifty basis. Federal aid is given to industry by protective tariff because it cannot compete with cheaply made goods abroad. This aid is not intended merely for manufacturers but for working men whose purchasing power is maintained through wage levels thus preserved. Again the laborer is protected in his work by the Immigration Acts which have barred from our shores hordes of cheap foreign laborers. Hundreds of millions have been spent upon our rivers and harbors to aid commerce and facilitate transportation. The expenditures in all these activities of the federal government have been made in the interests of the common welfare.

Maryland Farmers Join in Fight for Common Welfare

I am glad to tell you on this occasion that the farmers of Maryland have already enlisted in this fight for the common welfare. Their volunteers have joined the ranks of organized agriculture. Already 27 co-operative organizations marketing dairy products, fruits and vegetables, grain, tobacco, wool, and miscellaneous products have been established. These organizations have a total membership of 25,690 and the value of all commodities sold co-operatively amounted the past year to $19,000,000. Further opportunity awaits Maryland farmers in the establishment of a new marketing association. They can aid materially by

aggressively supporting the new program. For some time there has been considerable discussion by livestock producers in the eastern States territory for the establishment of co-operative agencies at Baltimore, Jersey City, and Lancaster, Pennsylvania. Preliminary meetings have been held, reports from surveys made in the territories have been filed, the outgrowth of which has been that a committee of livestock producers representing the States of Maryland, New York, Virginia, West Virginia, Tennessee, Pennsylvania, and North Carolina have developed the articles of incorporation and the marketing agreements. Several of the States have started campaigns toward a subscription in the marketing agreement and some real progress has been made. Much of the preferred stock has been sold, especially in Virginia where the leading livestock producers have enthusiastically entered into the program. Membership campaigns have been launched in other States and considerable interest manifested.

Success of Organization Depends on Support of Farmers

The success of the organization depends upon the support given it by livestock producers in this territory. Judging from the success of similar organizations in other sections of the country there is no reason why the Eastern Livestock Marketing Association should not succeed but that will depend entirely upon the support given it by the livestock producers in this area assisted by the producers of dairy products.

It is important to remember at this time that producers of dairy products should be equally interested in a livestock marketing association. While a livestock producer may not be a dairyman every dairyman is a producer of livestock, and therefore, the dairyman has a vital concern in the co-operative handling of livestock. The trouble in launching any co-operative movement is that farmers frequently get an exaggerated notion of the advantages that come to them from co-operative effort or do not realize the advantage of such group action.

Co-operation Is Not Magic Formula or Panacea

It should be remarked that co-operation is a method of doing business. It has its limitations but it has its advantages and can render to its members certain services which they cannot secure from the old time method of handling agricultural products. Co-operation is not a magic formula or panacea for all agricultural ills but it will help to stabilize farm conditions and bring to the producer a more equitable share of the consumer's dollar without increasing the cost to the consumer, depending upon the supply and demand conditions.

While much has been done to lay the foundations of a sound substantial system of co-operative marketing of farm commodities, more remains to be done in making effective the long-time program for the rehabilitation of agriculture. The task is of gigantic magnitude in the successful completion of which there is work enough for all groups and agencies, which can and are willing to make valuable contributions to its solution. The cause of organized farmers is just and in the interest of the common welfare. Organized farmers have put their hands to the plow and will not turn back.

CHAIRMAN MASSEY: The next gentleman on the program brings us greetings from the Ohio Farm Bureau, and we have had him here before. I am going to introduce Mr. Murray D. Lincoln, secretary of the Ohio State Farm Bureau Federation.

MR. MURRAY D. LINCOLN: Mr. Chairman and members of the Maryland Farm Bureau and affiliated groups: May I offer you our greetings and commend you as well as compliment you on the splendid program that is carried out here not only by the Farm Bureau, but by all the groups that have participated in this program. It seems to me that those of us who have given our efforts and life blood to the principle of co-operation the last twelve years, can well be proud of the progress that is being made. We enjoy the

affiliation that we have with the Maryland Farm Bureau in the promotion of automobile insurance, but let me say this, as a farm bureau secretary I only see in insurance another service, not something that is more important, in fact, a good deal less important than this one thing that I believe is more valuable and more necessary today than anything else, and that is that the American farmer learn the value of co-operative effort, that he be willing to co-operate with his neighbors in tackling some of the big problems that are certainly before us.

Some one made reference to an Athenian professor or a doctor. I would like to present him this problem and see what his answer would be. Suppose in the hereafter, because I take it he was here a good many years ago, we find a great country with many things in it, with much that is of value to the people, but one big group facing this problem—their mortgage indebtedness three times prewar or some other period, we call it prewar, their taxes two and a half times prewar, their land values the same as prewar, their income about 65 per cent of prewar, what would he recommend that they do?

Yet, that is the situation that the American farmer finds himself in. I wish there was some one thing that those of us who are engaged in this work could recommend to the farmers of our State and your State, that if they would do all this would be over, but I am frank to say I don't believe there is any one thing that is going to correct or solve this problem. I do believe the thing that will come nearer being a common denominator to at least making some progress in the situation that you face similar to our farmers is the application of this principle of co-operative, collective action in the solution of our problems.

I don't know what Dr. Symons is going to talk to you about tomorrow, but I would like to make this reference. The Extension Department and the Farm Bureau of the State of Ohio are seriously concerned with the economic condition of agriculture. We have talked about marketing

in a general way, we have talked about purchasing, we have talked about taxation, we have talked about credit, we have set up a lot of machinery through which the farmers today are making a lot of progress, but we have said we are not reaching the farmer as we should. Therefore, we are just now announcing a new service in co-operation with the College of Agriculture. We call it a business service, and we are saying to the Farm Bureau member, "We are here to help you succeed as a farmer. The University is supported by taxation and is here for the same purpose."

We are going to join together now in doing this one thing that I believe is more essential than anything we have yet done. We are going to get right down to the farmer's own back yard and say, "Mr. Farmer, what is your problem?" If it is an individual production problem the farm management expert is going to help him. If it is a marketing problem, we are going to show him what can be done through patronizing the co-operative institutions, and if the marketing and purchasing and other co-operative agencies aren't adequate to meet his own individual problem, we are going to find out, or try to find out why. Because, in my opinion, if we are going to get the progress in co-operative effort we must be able to show Mr. Individual Farmer that it is to his advantage, and that all these agencies can help him make more money.

So in the near future that is a service that is going to be added to the already many services of the Farm Bureau and the institution on the other side of town, the College of Agriculture, is going to render.

Now, just one statement in regard to insurance. Insurance is more vital in the scheme of things than perhaps you have thought of. We are not interested in promoting insurance just to save you a few dollars, but we are interested in it as one phase of a big problem to help you save money on something that is essential as well as some other things that you are going to see the effect of before long; to the extent that we can eliminate hazards, we improve

the condition of agriculture. Farmers have not begun to apply insurance to eliminate their hazards as they can. We already have automobile insurance, and have started life insurance which has been taken up by many of the farm groups.

We have just instituted a new insurance. In these days our farmers are losing poultry, and even fat cattle and hogs, so we are applying the principle of co-operative insurance to those losses. We are looking into health and accident insurance, and the Federal Farm Loan Bank at Louisville, has recently asked us to see if we can't develop a method of applying insurance to the stock that is pledged under the intermediate credit banks. Just recently our Farm Bureau set up the Agricultural Farm Bureau Credit Corporation. Let me say this. We haven't the time to discuss it here tonight, but if you farmers will go ahead and apply the principle of co-operation to credit as you have to marketing, purchasing, and insurance, I believe you will make more progress than any other single thing we have done up to date.

There is a wholesale rate for credit just as there is a retail rate. Up until the last week, the Ohio Farm Bureau for the conduct of its commercial activity has been borrowing money at 2½ per cent interest. Has any farmer here borrowed it, except from the Board, at anywhere near that rate? Our farmers in Ohio borrow $500,000,000 a year. Yet, the saving in interest doesn't begin to be the principal thing; we must form a system of credit so the farmer's hands can be untied, to see him patronize his co-operative marketing association and purchasing association. Whoever finances the business controls it, and I hold the reason you farmers have lost control of your marketing enterprises is that you let somebody else finance the holding of those products from the time you let go of them in the fall until the consumer wanted them in the spring.

Why do most of the farmers dump their wheat during a comparatively short time in the fall? To get money to pay

taxes, to pay fertilizer bills, or something else. You provide the farmer with a credit system so he can have money enough to go on and pay his bills, but at the same time place his products in the hands of the co-operative agricultural marketing association to feed to the market as the market desires, and you will render a real service. If you furnish a system of credit to the farmer so he can continue to buy his fertilizer from the co-operative he can save as high as 51 per cent. The United States Department of Agriculture has said this, and this is most significant. If the farmers in the States they surveyed had been able to go to the bank and borrow money at the bank rate to make their purchases, instead of using mercantile credit, the difference in savings between the bank rate and the mercantile rate would have meant that at the end of their period of farming the farmers would have been worth two dollars for every one that they were worth under the present system.

Do you get the significance of that? If there is any one thing that farmers can do to improve or double their net worth at the end of the period of farming, isn't it worth looking into? I commend to you just these few thoughts, because we are all interested in the development of this whole co-operative structure. Marketing won't do it alone. Purchasing won't do it alone. Neither will insurance. We in Ohio feel that the tax on real estate logically should be reduced approximately 50 per cent before it is fair in relation of our income to the income of others. When the farmer pays 27 per cent of his net income into farm taxes, and industry pays 8 per cent, we say there is something wrong, and if we will make the user pay for what he uses, and broaden the base of taxation for school purposes, there is a real opportunity for reducing the taxes on real estate very nearly 50 per cent, at least, we think so in our State of Ohio.

Outside of the individual production that a farmer does, everything that he attempts to solve in the way of marketing, purchasing, taxation, or insurance inevitably throws

him into contact with his neighbor. While the farmer with the help of college men can perhaps solve many of his own production problems, when he tackles these problems it must be done through some form of organization.

You have made a splendid start here in the State of Maryland. In fact, a lot of your associations ran away long before the association that we now have came into being. I have attended many of your meetings. It looks to me as though this is the best one that you have had, in spite of all the trouble that agriculture faces, and I think out of this very situation that we all face a lot of farmers, a lot of nonmembers that haven't up to date joined with any organization are going to feel the need of joining, to go with their neighbors.

Therefore, if this great co-operative machine that you have built here will be aggressive in promoting the services, in offering its services to the farmers, will be fair with itself in order to make that service just as effective as possible, and if we will all believe and talk co-operation, I know you will, it seems to me that there is a lot of good that can come in the future. In closing, I want to thank you for the privilege of being here.

REPORT ON STATE APPROPRIATION

The following is a financial statement of the State appropriation made to the Maryland Agricultural Society—Maryland Farm Bureau Federation, approved by the Council and submitted by the treasurer, Dr. T. B. Symons:

MARYLAND AGRICULTURAL SOCIETY—MARYLAND FARM BUREAU FEDERATION

Financial Statement for Fiscal Year 1930-1931

T. B. SYMONS, Treasurer

Appropriation for Fiscal Year ending September 30, 1931.....$5,000.00

Expenditures during 1930-1931:

Date	Payee	Classification	Amount Expended
1930			
Oct. 7.	Md. Farm Bureau Fed...	Office Rent (October).....	$52.92
14.	T. B. Symons.....	Reimburse (Drought Loan Exp.)..	111.00
14.	K. G. Connolly.....	Travel (Balto.-adjust bills).....	6.20
25.	Barton-Gillet Co.....	Printing (Drought Loan).....	20.15
Nov. 4.	J. P. Brown.....	Community Ex. (Wicomico Co.)....	39.75
5.	Bertha Moreland.....	Community Ex. (Pr. George Co.)....	15.00
7.	Md. Farm Bureau Fed...	Office Rent (November).....	52.92
7.	R. F. McHenry.....	Community Ex. (Allegany Co.).....	32.35
7.	T. D. Holder.....	Community Ex. (Caroline Co.).....	20.00
7.	Lucas Bros.....	Supplies (Seal & Book).....	16.50
18.	John H. Carter.....	Community Ex. (Garrett Co.).....	50.00
20.	P. D. Brown.....	Community Ex. (Charles Co.).....	50.00
20.	H. C. Whiteford.....	Travel (Meeting, Balto.).....	7.99
21.	B. M. Spafford.....	Community Ex. (Caroline Co.).....	20.00
25.	H. M. Carroll.....	Community Ex. (Harford Co.).....	25.00
25.	Olive K. Walls.....	Community Ex. (Talbot Co.).....	25.00
Dec. 4.	Priscilla B. Pancoast.....	Community Ex. (Cecil Co.).....	50.00
8.	Md. Farm Bureau Fed...	Office Rent (December).....	52.92
16.	Ernest W. Grubb.....	Community Ex. (Queen Anne Co.)	35.00
19.	T. B. Symons.....	Travel (Boston An. Meet.).....	12.40
20.	Louis H. Martin.....	Community Ex. (Colored).....	50.00
23.	Md. Farm Bureau Fed...	Travel (2 Delegates, Boston).....	100.00
24.	T. D. Holder.....	Community Ex. (Caroline Co.).....	10.00
1931			
Jan. 8.	Md. Farm Bureau Fed...	Postage	80.00
14.	Md. Farm Bureau Fed...	Office Rent (January)	52.92
14.	J. B. Edmond.....	Travel (Balto. An. Meet.).....	6.12
14.	Thyra E. Sanders.....	Travel (Balto. An. Meet.).....	18.50
19.	E. S. Good.....	Travel (Balto. An. Meet.).....	74.78
19.	E. S. Bayard.....	Travel (Balto. An. Meet.).....	34.50
19.	K. G. Connolly.....	Travel (Balto. An. Meet.).....	15.30
19.	B. & O. R. R. Co.....	Freight (Programs An. Meet.).....	50
Feb. 6.	H. R. Shoemaker.....	Community Ex. (Frederick Co.)....	30.00
6.	Md. Farm Bureau Fed...	Office Rent (February	52.92
11.	Geo. L. Schuster.....	Travel (Balto. An. Meet.).....	17.93
11.	Md. Crop Imp. Ass'n.....	Community Ex. (Balto. An. Corn and Potato Show).....	267.44
Mar. 11.	Md. Farm Bureau Fed...	Office Rent (March)	52.92
17.	Advertisers Engr. Co.....	Printing (Cuts for Report).....	4.25
17.	Md. Farm Bureau Fed...	Printing (Reporting An. Meet.)....	251.50
25.	Lord Balto. Hotel.....	Hauling (Balto. An. Meet.).....	5.00

Date	Payee	Classification	Amount Expended
Apr. 7.	Md. Farm Bureau Fed...	Office Rent (April)	52.92
16.	Advertisers Engr. Co.....	Printing (Cuts, An. Report)	9.50
May 1.	H. C. Whiteford.....	Travel (Balto. Meetings)	15.28
7.	Md. Farm Bureau Fed...	Office Rent (May)	52.92
8.	Hotel Rennert.....	Travel (Balto. Leaders' Conf.)	12.00
16.	Md. State Grange.....	Printing (An. Meet. etc.)	355.50
June 3.	Md. Farm Bureau Fed..	Office Rent (June)	52.92
11.	Florists Club of Balt.....	Community Ex. (Balto.)	109.20
30.	F. M. Payne.....	Other Exp. (Labor, An. Rpt., etc.)	75.00
30.	T. B. Symons.....	Other Exp. (Labor, An. Rpt., etc.)	60.00
30.	K. G. Connolly.....	Other Exp. (Labor-Accts., etc.)	50.00
30.	A. H. Snyder.....	Other Exp. (Labor, An. Rpt., etc.)	15.00
30.	Elsie Geis.....	Other Exp. (Labor, Clerical, etc.)	10.00
July 3.	Md. Farm Bureau Fed..	Office Rent (July)	52.92
28.	M. T. Johnson.....	Postage..	70.00
Aug. 1.	Md. Farm Bureau Fed..	Office Rent (August)	52.92
12.	Hyatt. Mfg. Co.....	Supplies (Ribbons An. Meet.)	7.49
29.	Md. State Hort. Soc.....	Travel (Reimb. 6—An. Meet.)	135.90
Sept. 1.	Md. State Hort. Soc.....	Supplies (Stationery)	18.75
2.	Md. Farm Bureau Fed...	Office Rent (September)	52.92
5.	Florence H. Mason.....	Travel (Balto. Meetings)	55.58
12.	Margaret Loar.....	Travel (Balto. Meetings)	28.90
17.	S. W. Wentworth.....	Travel (Timonium)	9.81
17.	C. E. Wise, Jr.....	Travel (Frederick, Tim., etc.)	9.01
17.	C. E. Wise, Jr.....	Travel (Balto. Meetings)	58.53
20.	F. M. Payne.....	Travel (Meetings in State)	75.00
20.	F. W. Oldenburg.....	Travel (Meetings in State)	57.12
20.	Twentieth Cent. Ptg. Co.	Printing (Placards)	19.36
22.	Md. Farm Bureau Fed...	Office Rent (Pt. Payment)	4.96
29.	Eva Falkenstein.....	Contributions (Garrett Co.)	11.00
29.	Charlie Miller.....	Contributions (Garrett Co.)	5.00
29.	Dorothy Emerson.....	Contributions (Girls)	100.00
29.	Univ. of Md. Press.....	Supplies (Stationery)	51.75
29.	Maryland Penitentiary...	Supplies (Stationery)	65.01
29.	Bertram L. Keyes.....	Contributions (Hauling Exh.)	33.46
29.	Hotel Rennert Co.....	Travel (Committee Meet.)	14.15
30.	Md. Farm Bureau Fed...	Contributions (exh. material)	110.80
30.	Elbert E. Buckel.....	Travel (Meeting)	35.00

Total Expenditures to Oct. 1, 1931, Paid by Treasurer.....$3,825.26

Paid direct by Comptroller's office for unexempted Expenditures:

Twentieth Century Printing Co. (Envelopes)	6.00
Twentieth Century Printing Co. (Stationery for Drought Com.)	188.01
Torsch & Franz Badge Co. (Buttons, An. Meet.)	35.00
Twentieth Century Printing Co. (An. Reports, bound and Separates)	945.73
Total paid direct by Comptroller's office	1,174.74

Grand Total Expenditures, Oct. 1, 1930, to Oct. 1, 1931..$5,000.00

CHAIRMAN MASSEY: We want to thank you people for your presence here this afternoon. The meeting is adjourned until tomorrow morning.

The meeting adjourned at five-five o'clock.

THURSDAY EVENING

The annual banquet convened at 6.30 P. M. at the Southern Hotel and promptly at 8 o'clock President Davis introduced the "Prince" of story tellers, and the peer of all toastmasters, the Hon. Thomas Parran.

Over 560 Farm Bureau men and women were crowded in the ballroom which proved far too small for such a gathering, but it was necessary to give up the Lord Baltimore ballroom in favor of Governor Ritchie's banquet.

Toastmaster Parran proved the veteran in overcoming the later moment developments. Secretary Hyde, the speaker of the evening, had his train to catch; the Farm Bureau folks out in the State, unable to get to the banquet, were tuned in on an hour broadcasting program and were awaiting the announcement of the winner of the Beauty Contest and the Song Contest, all of which were worked in to perfection. Secretary Hyde, after entering into an exchange of mirth-racking stories with the toastmaster, said in part:

"If you get organized", he asserted, "there will be an intermission in the long-suffering business. Farming is not a way of life but an industry, and organization is necessary for the farmer to bring his financial, economic and political power before the country."

Mr. Hyde stated that he had just returned East from Lincoln, Nebraska, where he had seen the degree of Master Farmer presented to eleven agriculturists. "As long as our country can produce men such as those who received the award and whose average wealth is $56,000, there is no need to despair of the future", the Secretary declared.

"American agriculture has become industrialized", he continued, "the average farm is no longer the self-contained

unit and economic enterprise it once was. Most farmers bend their efforts to the production of some one commodity. When farmers cease raising things primarily for the family to eat and wear, selling only what the family does not need, and begin producing a money crop primarily to be marketed, and buying things for the family, farming ceases to be merely a way of living and becomes an industry.

"I regret that the old-time farmstead is passing, but the change is in line with the trend of modern life. The vital point is that farming, having become an industry, must perforce conduct itself as an industry. Industry has found that only part of its job is done inside the factory. The problems incident to producing goods are only one group of the problems of industry. A large section of its problem lies in selling its produce at a price sufficient to cover the original cost of production plus a profit. Therefore, every industry has set up a selling organization and now agriculture is industrialized."

Following the Secretary's well-received address, G. Frank Young delivered an encouraging message from the business men of Baltimore, his subject being "The City Man and the Farmer." It was at this point that Baltimore and Kent counties sang the "American Farm Bureau Spirit," competing for the banner. The singers were led by H. B. Derrick and Mrs. S. W. Caldwell respectively. Those seated at the speakers' table who were the judges, announced Baltimore county the winner.

Winner of Beauty Contest

At no time during the evening, was Toastmaster Parran more in his glory than when he announced the winner of the State-wide Beauty Contest. Miss Stella McGrady, representing Cecil county was the winner, and received the handsome chest of silver which was the prize awarded by the State Federation. Toastmaster Parran made all of the other fifteen contestants happy as he presented each with a gold

piece as a small token of appreciation for their co-operation in making the contest a success.

Of course, song leader, William R. McKnight and Mrs. Evelyn Harris were in charge of the singing and contributed in no small part to the success of the evening.

FRIDAY MORNING

January 8, 1932

The Third Session convened at ten o'clock, Mr. Massey presiding.

CHAIRMAN MASSEY: Ladies and gentlemen, I wish to introduce your presiding officer for this morning, Mr. E. P. Cohill, the first president of the Maryland Farm Bureau Federation.

CHAIRMAN COHILL: The first thing on the program is greetings from the Extension Service, by our old friend, Dr. Symons. He and I started out together, and I guess they want us to wind up together. Dr. Symons, I can't introduce you too often. (Applause).

THE STATE AGRICULTURAL PROGRAM

By DR. T. B. SYMONS,

Director of Extension Service.

Mr. Chairman and Friends: It is a matter of great gratification that we assemble this morning to conclude what I firmly believe is the most constructive, inspiring, and satisfactory convention that this organization has ever held in the State of Maryland. We have had a wonderful attendance, we have had a steadily growing interest, and we have enthusiasm for organization which I believe will count in 1932 in the State.

I can't in words express on behalf of the members of our Extension Service and the whole force at the University

the appreciation that we feel, the gratitude that we experience in working with this and other organizations in the State. There isn't any doubt, my friends, that harmony is a fruit of life that means much to each and every one of us, and the harmony that exists between the Grange folk and the Farm Bureau folk, and our commodity organizations and our Extension Service and educational agencies is something that we can't value in dollars and cents. We can't count it in any thing but accomplishment that comes from co-operative efforts.

I must reciprocate the sympathy and the confidence that we have in the great president of this organization, James W. Davis. (Applause). And I reciprocate, if possible, in a more earnest manner than was so eloquently expressed, our good secretary, Frank Payne. (Applause). We appreciate his work, his efforts to serve, and his efforts to co-operate in the big job that faces all of us in this good old State.

I could go down the line through the county presidents, and I would like to express the heartfelt feeling of our county agents and our home demonstration agents for the co-operation that is given in every section of the State. But suffice it to say, as our distinguished chairman has said, we have worked quite a number of years in the State. I trust that it serves to make us feel humble in the service of the farmers of Maryland as well as the home makers, and that this co-operation and this sympathy will spur us forward to render every possible service in the future.

We have a big and splendid job. We are confronted with a challenge that no folk was ever confronted with. We have an opportunity to make prosperous, to develop contented homes, and to develop rural Maryland and make it such an asset to the whole State that we will all be proud of our accomplishments, and we will all render a service to the nation.

I am going to give a divided talk this morning. I have two distinguished associates that are going to contribute the main part of these remarks. I thought you would be

interested in the citation of at least two of the projects that have been developed during the year.

We have our agricultural and rural home program that is being prosecuted throughout the State. We have a number of counties that are setting up their own programs. We have made distinct accomplishments during the past year. We have reduced the wheat acreage in Maryland to the point that the program called for in five years, already. In other words, there has been a reduction of nearly 20 per cent in our wheat acreage, and in a few moments I am going to try to give you just a picture of the agriculture of the State so that we may see how we will shade that picture in developing our program and developing the industry for what we all believe to be the most profitable ends to be served.

I said the other morning to a club conference—and we had a grand meeting, and I hope to impress the folks over the radio at twelve o'clock, that if there is an outstanding feature of this convention, Mr. Chairman, it is that we have had more young folks here than ever before. (Applause). And when we can command the attention, the enthusiasm, and the spirit of youth, we may have great hopes for the accomplishment of our aims and programs in the State. But I said to them, "Young women and young men"—it was the largest meeting of all the sectional meetings on Wednesday—"you are coming into a civilization, that presents a stimulating challenge to you all; we have too much wheat and not enough bread; we have too much cotton and not enough clothes; we have too many bricks and not enough houses, and we have too much drudgery and not enough jobs; also, too many goods and not enough money. The economy of abundance has technically displaced the economy of scarcity." These young men and women coming into the business of agriculture will meet that challenge. May we in the development of this program so employ our intelligence and experience, as to realize that no State in the Union has the opportunity of Maryland, where we have a diversified agriculture, where we are within a hundred

miles of ten millions of people. Our problem is going to be to grow food for human consumption, and so adjust our agriculture to make it profitable from that standpoint.

I want you to see this chart. An artist can draw a picture, he can display his thoughts, and interpret them. This is a picture of the State of today. It shows what we are now doing. This represents the gross income from Maryland farm products in 1929. You will note the block of dairying. You will note chickens, and eggs representing $14,000,000. Incidentally, $24,000,000 for the dairy industry is the largest single income in the State.

We have had almost a 50 per cent. increase in the poultry industry during the past five or six years. You will note cattle, hogs and sheep representing about $10,000,000. You will note tobacco, which is a staple crop in Southern Maryland, and isn't it remarkable that when in the great State of Kentucky they have millions upon millions of pounds of tobacco, three years' crop, and can't dispose of it at five cents a pound, and they had a number of co-operatives formed in that State six or eight years ago, none of which are existing today, that we have our Tobacco Growers' Association, and our Southern Maryland tobacco crop is bringing a better price than any other tobacco in this country.

Now, the crop has been increased this last year. In fact, it has been the hopes of the tobacco growers to largely increase the acreage. But certainly, from 25 to 50 cents a pound, depending upon the quality, think of the wonderful opportunity and consideration that we must have for a section of the State that will produce a quality tobacco that is demanded by the people of the country.

We don't ordinarily realize the extent of the truck crop industry, amounting to $15,000,000; the fruit, nursery and floriculture industry, representing nearly $9,000,000; and the grain and hay industry, representing $13,000,000. This miscellaneous item includes forest products, maple sugar, and some other minor features that are grouped together.

Now, in developing a program, where can we contract and where can we expand? We naturally are going to produce that product that is needed by every human soul in the State as well as elsewhere, milk, and through our co-operative dairymen's organizations I hope that we will hold the production of milk in the range of consumption, and that our organizations for increasing the consumption of milk, a million folks in this city drinking a pint or a glass of milk a day, you can think of the possibility of increasing that to two glasses, and you know what the doctors say should be the proper amount of milk for an individual each day.

There is a job for the Farm Bureau; there is a job, as the distinguished Secretary said last night, for a business organization; there is a job for a program and a planning organization as well as a sales agency.

The truck crops are going to develop in demand as we encourage our people to eat fresh fruit, and in proportion to the quality and the pack we will put on the market. So that in brief, and to conclude, sometimes we don't think of this poultry industry in the importance that it is to the State. Poultry is raised on 39,000 of the 40,000 farms of Maryland; twenty million dozen eggs sold, not one sold co-operatively—isn't that a challenge to us? Not one egg is sold co-operatively. And the California eggs, 3,000 miles away, nine days coming to New York City, bringing a better price than Maryland eggs have ever brought. There is an opportunity.

The dressed poultry market is important, and there is an exhibit at this conference—there is a great opportunity to develop the turkey industry. While this cites chickens and eggs, there is no competent figures on the turkey industry, as well as the ducks and other fowl. We have had splendid developments. As I told the poultry people, it has been the chickens and eggs and poultry that has enabled the mothers on many of our farms to dress the children and feed the family during these depressed times. So let's

give thorough consideration to the growing importance of the poultry industry.

Cattle, hogs and sheep are developing, but we cannot hope ever to have that industry approach these others. But we can improve it tremendously. The efforts of the live stock show and the efforts of the co-operative that we are now about to form are going to be a wonderful incentive towards the production of quality in these products.

So in brief, here is where we must do some cutting: In the small grain section. You see we can't do anything here except improve the quality, and perhaps expand. The same is true of poultry. The same is true in tobacco. We will remain just about the same for that area. The same is true in truck crops. We can improve there, and also we can expand.

There has been a tremendous development of the fruit and nursery business, probably over-developed, some features of it, just now. But there will always be a demand for flowers. There is always a growing demand for improving home grounds. That is one of the encouraging things that has developed in the last two or three years.

So you see here is a section where we will make some adjustments, and we have reduced the acreage of wheat from 600,000 acres now to 487,000 this coming year. The same will be true with the introduction of more barley and more oats to feed our dairy cows, and thereby increase more economical production.

Mr. Chairman, I have taken too much time now. I simply wanted to present that picture. We are going to start on a program this year of farm accounting, perhaps the greatest challenge that has come to every Farm Bureau member. If the Farm Bureau of Maryland can put across in co-operation with our educational forces a system of farm accounting, so that every man in this room will know what it is costing him to produce his crops, will know his inventory, and know the results at the end of the year, it will mean a very distinct accomplishment in the business of agriculture.

So I am going to ask Mr. Nystrom, a young man who has had extended experience, to give you for a few minutes what we plan to do in co-operation with our county agents, in co-operation with the local farm organizations in the respective counties of the State. Mr. Nystrom. (Applause).

FARM ACCOUNTING PROJECT

PAUL NYSTROM, Extension Economist.

I feel greatly honored in being asked to present to you this morning the details of a project which we believe will occupy an important position in the State agricultural program during the next few years. We feel that this organization and this body of men and women should know what the Extension Service is undertaking in a serious way for the first time during the coming year, a piece of work that was never more urgently needed than at present. In discussing the topic, "The Farm Accounting Project", I shall discuss:

I. How the present time is a peculiarly appropriate one for such a project.

II. How we expect to conduct this project.

III. I shall present some charts to show how, by the use of accounting records, we may analyze efficiency of a farm as a basis for a program of readjustment.

All of you know, all too well, in what a serious condition our industry is today. All of you know that for a number of years those of you who live on farms have had to pay much more for the things you buy than you have received from your own products. And at the present time, bad as the condition of farmers may be, it is not much worse than that of other industries.

Let me briefly compare the economic position of agriculture with that of other industry. The wholesale price level

of all commodities stands exactly at the prewar level, the industrial wage level is twice that of prewar; farm taxes are two and one-half times the prewar level; prices of things bought by farmers are 25 per cent above the prewar price level, but the prices received by farmers for their products are more than 30 per cent below what they received before the war.

All business is making adjustments to the lower price level. The period of hoping for an immediate recovery of the prosperous conditions in business, existing prior to 1929, has passed. Business is sobered by the realization that because of world-wide conditions, inter-governmental debts, monetary troubles, trade barriers, depreciated incomes and the like, we will probably have to carry on at a much lower price level than that of the ten-year period following the war. Business is striving for an efficient low-cost production at a lower price level. In the financial section of nearly every newspaper and trade journal, we read the term "balanced budgets". That term means simply to budget expenses at a point below expected income so that a profit may accrue even at a lower price level. Every economy that can be practiced is being practiced, every method for increasing efficiency is being adopted, every detail of business is being thoroughly studied, and analayzed in the hope that some little improvement, making for greater efficiency, will be possible. These measures make absolutely necessary an accurate and a complete system of accounting to know what is the cost of handling each line of merchandise and what is the cost of operating each department. These records serve as a background for a sound business and management program.

Now, what are farmers going to do to keep pace with the increased economy and increased organization for efficiency that is being accomplished in other business. We, as an industry, are producing the raw materials for other industry and unless we can operate as efficiently and as success-

fully as they, we will become in the end little better than slaves.

We, as farmers, have not given much attention to the business aspects of farming. We have been so busy producing goods that we have not done enough farming with our heads. But we must come to it now. Those of us who do not study our business to discover its weak points and bolster them are going out of business. We are past waiting for legislation to cure all our ills. We must help ourselves.

Here is where the Extension Service proposes to lend a helping hand. We are offering to the farmers of Maryland to assist them to analyze their own business, to single out the factors that determine the profitableness of their business and to assist in preparing a program of adjustment that will make for increased efficiency in the years to come.

Our program is a forward looking program. While there are many adjustments that are being made at the present, such as practicing strictest economy and producing for home consumption—measures of retrenchment, these are emergency measures. We need to think also of the years to come. How are we going to make ourselves more capable of carrying on in the face of the low price level which will probably prevail during the next five to ten years and in the face of increased efficiency of other business?

We have a program of supervised cost accounts that we are inaugurating this year. Each county agent in the State has as an important part of his work for the year a project with a limited number of farmers in his county. Our aim during the first year of this work is to carry on with at least ten farmers in each county.

We have prepared a record book to use in this project which is as simplified as we could possibly make it and a book in which a record may be kept for each enterprise of the farm with simplicity and with a minimum of effort. This book is to be given free of charge to any farmer who will keep a record in it.

Individual assistance will be given to each farmer co-operating with us. At a convenient time during the next two months the county agent and the Extension Service representative will meet with a group of farmers in each county to explain the purpose and value of our method of analyzing the efficiency of his farming operations and to give him some necessary instructions in keeping his record. We will then give personal assistance in starting the record for the year. As soon as the circuit of the State has been completed the Extension Service representative will go right back again to each farmer, visiting him individually four or five times during the year, checking up on the keeping of the farm record, bringing it up to date, and carefully supervising his record keeping.

At the close of the year a careful summary will be made, factors of efficiency will be singled out and to show you just how this work will then point the way to readjustments of farm organization and management and to the making up of a sound management program for each farm, I have some charts to present to you.

These carts were prepared to illustrate what are the major factors of efficiency upon a farm and how may the weak points in the operation of any one farm be singled out and corrected.

A few years ago the Department of Agricultural Economics at the University of Maryland undertook a study of more than 500 farms in Maryland, to extend over a period of years, to determine what caused the obvious variations of incomes between different farms, whether the factors affecting profitableness may be measured and whether weak places in the set-up of any one farm might be detected and remedied. We are now in the third year of the study and we now have complete business records (taken by survey) for two years, 1929 and 1930, of income, expenses, investment, acreage, and other details for more than 500 farms

from representative areas in the Eastern Shore and in the Piedmont area of Maryland. We have singled out for comparison the farms of each type in order that we may compare similar farms—for obviously, the factors of efficiency are different for a poultry farm and a dairy farm. Those farms of a given type having high incomes are compared with the farms of that type having low incomes and reasons for that variation are determined.

We discovered that the more profitable dairy farms (and I shall speak of dairy farms now because I believe most of you are interested in dairying and because it occupies such an important position in the agriculture of our State and lack of time will not permit me to discuss other types of farms) during the two-year period, 1929-1930, obtained an income above operating expenses more than $3,000 greater than the less profitable dairymen; they received for their labor and management more than $8 per day as compared to a loss of $2 per day on the less profitable farms; they obtained a return of 15 per cent on their investment, while the less profitable farmers suffered a loss of more than 4 per cent on their investment. (See Table I.)

There are very good reasons for that tremendous difference in incomes. Of the factors which affect income from farming we have very little control over some, such as disease, climate and economic conditions. There are, however, four principal factors over which we have some control, namely:

1. Size of business.
2. Efficiency of livestock production.
3. Crop yields.
4. Labor efficiency.

Size of Business

The size of a farm is represented not only by acres but by income producing capacity, by acres in crops, by investment, and by productive units of principal enterprises.

Table 1. Incomes of Profitable and Unprofitable Dairy Farms in Piedmont Area of Maryland, 1929-1930

Measures of Return	35 High Farms	35 Low Farms
Receipts	$6,636	$4,317
Expenses	3,071	3,827
Farm Income	3,565	490
Labor Income	2,584	—808
Return on capital, per cent	15.1	—4.2

I am representing each measure of size by a bar. The black bars are for the high farms and the red bars are for the low farms. By the length of each black bar as compared to the corresponding red bar, you can see how the factor for the best farms compares with the factor for the poorer farms. Each set of bars is drawn upon a different scale.

Table II. Comparison of Size of Business of Maryland Dairy Farms, 1929 and 1930

Measure of Size	High Farms	Low Farms
Gross income	$6,636	$4,317
Crop acres	78.3	101.3
Investment	$19,600	$25,900
Dairy cows	18.4	16
Hens	161	132

Please note that the gross income from the better farms is nearly 50% greater, $6,636 compared to $4,317; the acreage in crops is much less, 78.3, compared to 101.3; investment is considerably less, $19,600, compared with $25,900; there are a greater number of productive livestock, 18.4 dairy cows compared with 16, and 161 hens compared with 132. The better dairy farm is smaller in size and in investment, with a lower overhead expense and with more livestock. The emphasis is less upon crop production and more upon livestock production.

The factors for any one farm may be compared with the factors of both the high and low groups and if size of business is a difficulty on a farm it may be detected. If so,

there are two lines of remedy; expand acreage by purchase or renting of additional land, or intensify production.

Live Stock Returns

Not only do the better farms keep more stock, but they keep better stock. Please notice that milk sales are considerably greater on the better farms, $4,100 compared to $2,820. They are due not only to a larger size of herd but also to greater productivity per animal with sales amounting to $50 more per cow on the better farms, $223 compared to $176 per cow. Production might also be expressed in terms of pounds of milk and pounds of butterfat and one could determine how much of the difference is due to selling price.

You will see that poultry is an important supplementary enterprise on dairy farms. Egg sales on the better farms are more than twice those of the other farms, $428 compared to $203 and amount to $35 per month, almost enough to supply the groceries. The difference is accounted for in large part by greater productivity per hen, an excess of $1.12 sales per hen, $2.65 compared to $1.53. In the last item please note the difference in feeding efficiency. On the better farms, livestock returns $1.43 above each dollar of feed cost; on the other farms only 45 cents above cost is obtained, a total of $2.43 compared to $1.45. There can be little doubt that the better farms are feeding better livestock.

A comparison of livestock efficiency on any farm with the factors for each of the two groups of dairymen will point out obvious adjustments to make.

Table III. Livestock Efficiency on Dairy Farms, 1929 and 1930

Items	High Farms	Low Farms
Milk Sales	$4,100	$2,820
Milk sales per cow	223	176
Egg sales	428	203
Egg sales per hen	2.65	1.53
Livestock returns per $1.00 feed cost	2.43	1.45

Crop Production

Production of crops on the better dairy farms is largely for the purpose of growing feed for livestock. There is, however, some production for market. Greater crop sales per acre on the better farms, $14.91 compared to $9.22, indicate perhaps that more truck crops are grown. It is the yields of crops, however, that are significant. The better farms obtain higher yields per acre—51.6 bu. of corn compared to 45.4 bu., 24.3 bu. of wheat compared to 18.9 bu., and 1.7 tons of hay compared to 1.5 tons.

Certain significant questions arise when such data for a farm are analyzed. What kind of seed do I use? What about my rotation? Do I pay enough attention to building up my soil fertility?

We propose to measure such data as these in our cost account work, the use of certified seed, the application of lime, fertilizer, and manure, the use of legumes and the like, and we believe we will obtain significant data for each farmer in the project.

Table IV. Crop Yields on Dairy Farms, 1929-1930

Items	High Farms	Low Farms
Crop sales per acre	$14.91	$9.22
Corn per acre, bushels	51.6	45.6
Wheat per acre, bushels	24.3	18.9
Corn per acre, tons	1.7	1.5

Labor Efficiency

Please notice that labor cost is considerably less on the better dairy farms, not only the total cost, $1,487 compared to $2,041, but also less per acre of crops even though the acreage is considerably smaller, $19 per acre compared to $20.16. It may be that time is more efficiently planned and that labor is more efficient, but it is also significant to note that machinery investment is greater on the better farms, $15.86 compared to $12.43. Each man on the better farms

actually handles a larger acreage. A careful comparison of dairy farms will reveal greater labor-saving devices, more efficient and better kept machinery and a better layout of fields and buildings to conserve labor, the most expensive item of expense. You will note that labor is more productively employed on the better farms. Out of each $100 income on the better farms only $22.41 went for labor compared with $47.28 on the low group of farms.

When any farmer sees such data as these we do not have to tell him what adjustments seem desirable.

Table V. Labor Efficiency on Dairy Farms, 1929-1930

Items	High Farms	Low Farms
Labor cost	$1,487	$2,041
Labor cost per acre	19	20.14
Machinery per acre	15.86	12.43
Acres per man	31.3	29.8
Labor per $100 gross receipts	22.41	47.28

There are many other measures of efficiency that may be compared. And a similar comparison can be made for any type of farm. They all indicate reasons for comparative profitableness of farms and point the way to a sound program of adjustment.

We will assist farmers to make an analysis not only of their whole farm but also of each enterprise. During 1929 and 1930 a dairyman in Howard county, who kept a record, learned that he was after all not a dairyman but a poultryman.

Our observations have been that it takes about 3 minutes a day to keep a farm record. A habit can be formed that will not make record keeping a tiring job. We will give every assistance.

Ladies and gentlemen, other business men pay good money to high priced accountants to install accounting systems, to analyze their business and make recommendations. The Extension Service offers an accounting service to farmers

free of charge. Our Director is determined to lend every resource of the Extension Service to make this project a success. No farmer will lose a thing in these times of need for greater efficiency in operation and management, who joins our extension project in farm accounting.

DR. SYMONS: Now, ladies and gentlemen, I want you to hear from Mr. S. B. Shaw very briefly the results that have been accomplished during the past year in the marketing work from the standpoint of inspection. The canning industry is a big industry in Maryland, and perhaps it is going to constantly increase if we will see the needs of the hour of improving the quality, yields, etc. So I asked Mr. Shaw if he would not give you very briefly the results of the canning house inspection work this past year, which is only a forerunner to corn, peas, and other canned crops, and others in the industry will demand the same.

MR. S. B. SHAW: Mr. Chairman, ladies and gentlemen: Before attempting to show you the results of this work, I would just like to make one point clear for the benefit not only of the producer, but also the individual who may use inspection service.

In the minds of some people who have not had the experience of using a service of that kind, they immediately think it is of a police nature. Understand that inspection is a service, and it is not a policeman. Our fruit growers and our vegetable growers eight years ago when this service became available through the co-operation of the various States and the Federal Department of Agriculture, soon realized they had the opportunity of making use of services of that kind. Why? Sooner or later any product you produce, I don't care what your products are, or how good they are, somebody is going to inspect them, and on the basis of that inspection you are going to have your return.

It has been demonstrated time and time again, and I think the majority of our fruit growers will bear me out in this statement, that the closer to home they can have that inspection made, the more profitable it is for them. As

one fruit grower very aptly stated, he didn't want a certificate on a carload of fruit if it was out of grade. What he wanted to know was whether or not he could pack that carload of fruit and have it in grade before it started to market. That is the object of inspection service, to help our growers put out a product prepared for market so it will bring its true value and the highest value. It is not going to work any hardship on anybody, but it is a real service.

Last year in connection with the growing and canning of tomatoes the service was requested by 25 canners at 27 points. True, all of them didn't have their entire receipts inspected, but this is merely to indicate the canneries, the number of loads, and the number of baskets in each load.

(Chart). You will notice that these loads ran in number from 69 to 1,650.

Just to give you an idea as to the location of this activity, you will note the greatest number of requests came for this service in Dorchester, Wicomico, and Caroline counties, two points in Kent, and one in Western Maryland.

Of the entire tomato production devoted to canning house purposes amounting to 4,900,000 baskets, 15.9 per cent were bought on a graded basis. That is a pretty good showing for the first year. Our fruit and vegetable people didn't have that showing the first year they used it, though they use it almost a hundred per cent now on peaches and apples. The potato people are using it to the extent of at least 85 per cent. We inspected this year approximately 2,300 cars. Ordinarily we have 1,200 or 1,500 cars of potatoes, but this year the potato crop was light and our potatoes fell off, but on the other hand, there was a decided increase of apples.

Market conditions were such that instead of having peaches inspected, most growers had to sell direct from the tree, so we only inspected about 40 cars of peaches. That shows why we were not up to our average.

Of the tomatoes that were inspected 10,500 loads were delivered with culls, and 3,000 loads came to those factories without any culls whatever. Analyzing the loads containing culls, you will see the percentage here, the number of loads, about 7,500 that had less than 10 per cent culls, 4,100 loads had from 10 to 20 per cent culls, 1,200 loads had from 20 to 30 per cent culls, and 400 loads 30 and over of culls.

That is very significant when you consider that under this system at least 3,000 loads were brought in without any culls. What does that mean? These tomatoes were bought on a graded basis. A certain price was paid for No. 1's and nothing for culls. To illustrate whether or not it may be profitable, there were two young men I have in mind.

These two young men came in, and the basic price on tomatoes was twenty cents per basket. The first load of tomatoes they brought in, including the culls, averaged eighteen cents a basket. The inspector showed them how to select their tomatoes, and they did, and brought them in for the balance of the season, and their average price was 27 cents a basket. Ordinarily they would have had 20 cents a basket, but as it was, they got 27 cents a basket for every basket of tomatoes they delivered. That experience could be multiplied time after time.

In another instance, a grower had his tomatoes inspected and delivered to the factory, and when he went away he found his load was worth $1.75 more than it would have been ordinarily. As he was commenting on this fact the canner did a little figuring and he found the load was worth $1.75 more to him. So they both agreed. A group of canners and growers both decided it was far more profitable to have inspected tomatoes. I don't say that it is more profitable. I am simply passing on to you the ideas of the growers and the canners combined.

The basis on which I will explain this for the benefit of those who may not be familiar with the way the tomatoes were bought—if the flat basic price was twenty cents a

basket, the canner agreed to pay to the grower thirty cents for No. 1's, 15 cents for No. 2's, and culls out. In other words, he offered the incentive there to the grower to cull his tomatoes, because if he culled his tomatoes and delivered No. 1 stock, he was able to get 50 per cent more for it on a grade basis than he would have on a flat rate.

MRS. HARRIS: Does the basic price apply to all counties?

MR. SHAW: The basic price is agreed upon by the canner. The inspection had nothing to do with what the canner paid. That price varied. In some places that was the price that was agreed upon and it was paid by the majority of the canners who used this service.

MRS. HARRIS: Will you explain the difference between a No. 1 and a No. 2 tomato?

MR. SHAW: If I had known that question would be asked, I would certainly have had samples here to show you. There are lots of folks here who think a No. 1 tomato must be perfect. It isn't. It is a tomato from which 80 per cent of the solid matter can be salvaged, providing the color is charcteristic of a red, ripe tomato. The majority of growers have a very hazy idea about what is the characteristic color of a red, ripe tomato. I say that advisedly. I mean when it comes to the market. But go to their homes and see what they put on the table to eat, and they have a mighty good idea of what a good red, ripe tomato looks like. But when it comes to going into baskets, it is rather hazy.

There isn't a bit of use trying to sell waste material. Some folks have the idea that a canning house takes these cull tomatoes and because they are delivered at the factory, they go on in and enter into the process of manufacture. I know there was a time when that occurred. But I will say this for the benefit of those canners who had inspection this year: I went through their plants, and watched to see whether or not they did use culls. The only place that the cull tomatoes came in was the increase in the cost of throwing them out.

I know in one factory a man had the reputation of putting up pretty common stuff. I want to tell you right now that that man's cost was increased ten per cent in trying to get rid of these cull tomatoes that he couldn't use and he didn't use. I saw one grower come in with a load of tomatoes, and the canner told him, "Friend, I will give you ten cents a basket for those tomatoes if you will haul them out there and dump them in that field and keep them out of my factory. It costs too much to bring them into the factory and get rid of them."

Those men who had inspection did not put up cull tomatoes, I don't care what anybody says. They weren't putting them up; they were throwing them out, getting rid of them, because they couldn't afford to put them up. I want to ask you growers just one question and especially from the canner's point of view. What canner can afford to put up sub-standard tomatoes at 50 cents per dozen cans when they don't pack out that way? You can't afford to do it. The canner can't afford to do it, and the grower can't afford to grow tomatoes like that, tomatoes that are sub-standard, because the grower soon goes broke.

MRS. HARRIS: Were most of the No. 2's on color? That is what I am trying to get at.

MR. SHAW: The principal thing that determined the grade of the tomato was color. It is not defects, notwithstanding the fact that we had excessive rains on the Shore; you folks on the Eastern Shore know the rains we had—it wasn't defects, it was color.

This chart is to show you people from twenty canneries the proportion of No. 1's, No. 2's, and culls. You will notice in factory No. 1 it was 5 per cent culls, you will notice they had 58 per cent No. 1 stock, and 36 per cent No. 2 stock. In that particular instance, that factory had the minimum number of culls delivered, and it certainly was more profitable. It is more profitable to the group of growers for the canner to be able to put up and utilize 95 per cent of what was delivered at the factory.

You will find down here that even in the factory with the greatest amount of culls they only had 17 per cent culls. The average was only 10 per cent of the entire crop.

On this chart we have tried to show graphically just what that means in regard to the total number of baskets bought on a graded basis. There were 782,000 baskets bought on a graded basis. This represents your hundred per cent; that is the total. Of that total 700,000, or 90.8 per cent were merchantable tomatoes. The canner could use them to put out on a grade and make a profit for him to return to the grower for his goods.

Of that lot there were less than 79,000 or 10 per cent of the total amount of tomatoes delivered that were culls. Now, that 10 per cent is what we are interested in. We are interested in reducing that 10 per cent, because that 10 per cent is waste to everybody. The minute you take it away from your farm it costs you something to handle it. What is the use of paying out good money to attempt to market a product for which there is no use? That is what we are interested in. We want to get that line down, reduce that 10 per cent. We want to raise this line so it will come as nearly as possible to you hundred per cent. That is what inspection is. It is a service to help not only the producer, but also help all along the line in eliminating waste, and I think you will agree with me, you folks, if you go out to buy a product you don't want to buy a waste product from any manufacturer when you are buying clothes or goods or anything else, you don't want to buy waste, so why expect somebody else to accept waste from you, a product which they can't use? Our service is to help eliminate that waste and get you the highest possible price for the true market value of your commodity. (Applause).

DR. SYMONS: I am sorry we have taken quite so long, although I think we are within the time allotted us. We are indebted to Mr. Shaw and to Mr. Nystrom for this introduction of some of the important features of our work that

our associates at College Park are doing, farm accounting inspection, and many other things.

SENATOR HARRY: Was the farmers own labor counted in?

DR. SYMONS: Yes, but it was not counted in with the expenses of writing the net income between arriving at a measure for determining what the farmer's own labor was worth to him, and we found in one case it was worth $8.00 a day, and in another case a loss of $2.00.

May I throw out a suggestion to the county farm bureaus? Can't we have a contest in the number of farmers who are going to keep books this year, set a goal of ten for each county? Can't we have the farm bureaus as business organizations get behind that project, and let's have a report this next year on the accomplishments of the farm accounting project. (Applause).

CHAIRMAN COHILL: The inspection of eastern apples has cut the sale very materially in the last year or two of the northwestern apples, in fact, to such an extent that the northwestern people, as you know, are looking to some other place for a market instead of bringing their apples east. It shows what inspection has done in that line. It has compelled our eastern fruit growers to grade their apples, and after they had them graded, they had a good apple.

Another thing I wanted to call your attention to—there are thousands of carloads of produce, vegetables, fruit and food products that go right past here to New York City. I did know a few years ago how many carloads of apples go through, I think fifty or sixty carloads a day go to New York to feed their population, and also potatoes. It is amazing. And if we people here would grade our stuff, we would stop the potatoes and everything else from coming through. I was out in Idaho a couple of years ago, and they were wrapping potatoes up in paper and packing them in boxes and sending them here and selling them to our people, and the potatoes weren't a bit better than our own.

I was over in Denmark two years ago to ascertain why it was the Danes had taken our bacon trade away from us. You know there is no bacon goes to Europe any more. We found out that we had been producing the wrong kind of hogs. Here we produce a short, broad, fat hog, which makes plenty of fat, but those people over there are given premiums for the longest hog they can find. They look like our razor backs. And they cut those hogs up into bacon. Everybody wants bacon now, and I can't understand why our farmers in this section will still continue to grow what the people don't want. They don't want fat stuff. You can hardly sell lard now.

Another thing. During the last two years we have been building magnificent high schools for our boys and girls, and I want to tell you what they use those high schools for over in Denmark. Attached to nearly each one of them is a dairy where the girls and boys bring their milk, and the farthest any of them go to school is 12 miles—they bring their milk in the morning to the school and process it, turn it into butter and cheese. They go to school at seven o'clock in the morning.

We have got to come down to earth here and change our method of living if we want to get ahead. If we don't, we will go to the poorhouse, and the poorhouse will be so full there won't be any room. Our report back here to the Farm Bureau was that the Danes could buy our feed, take it over there, and feed it to their hogs and cows, bring the product back to New York and undersell us, and live better than we do.

MRS. HARRIS: Were there any labor charges?

CHAIRMAN COHILL: I don't know anything about that. We didn't inquire into labor. Those children get credit for anything they do in the high schools. They know how many gallons of milk a girl or boy brings to school, and they know how many hours they work on it, and they get credit for all that, and it is all sold under one co-operative organization.

We have magnificent high schools here in this country, and we have been spending a lot of money. Really, the most of our taxes for the last few years has been going for high schools, hasn't it? Now we have them, and all we need to do is attach a creamery to them and let the children go to work like they do in Denmark.

Mr. S. A. MacCrae, of the United States Employment Service is here, and we are going to give him just exactly five minutes.

MR. MACCRAE: You don't need to time me, as I shall need only about two minutes. Mr. Payne has very graciously allowed me to come before you to explain the service now being rendered to the citizens of each State by the United States Department of Labor through the employment services which are being set up all over.

We have central registration places in all of the large industrial centers, and are going to take registration of unemployed people in the other places where we know there are surpluses of labor, either farm or factory. Whenever in the future you need a good workman, if through your local secretary of the Farm Bureau, that is, providing you don't have the right type of labor in your own county, if through your local secretary of your Farm Bureau you will let Mr. Payne or Dr. Symons of College Park know of your requirements, we will be able to furnish the right type of help for you.

Those men have been registered, their credentials have been gone over, and we know exactly what they can do and what they have done. We know their education, we know where they work and everything about it, and we think that it will be a more efficient way of getting your labor, and we certainly want to serve you and Mr. Payne at any time on any call from any farmer in the State of Maryland, and I might say we can help those men get to your farms without any expense to you. (Applause).

CHAIRMAN COHILL: Now will the delegates please come forward and take the first few rows of seats.

There was no Committee on Constitutional Amendments, so we will hear the reports of the Resolutions Committe. Mr. Massey is the chairman.

MR. MASSEY: Mr. Chairman, the Resolutions Committee has given careful consideration to the resolutions given to them and to all who desired a hearing, and we respectfully submit these resolutions, which the secretary will read.

RESOLUTIONS

No. 1. We commend the Maryland and American Farm Bureau Federations in their work during the past year and pledge during the coming year our whole-hearted support in assisting the officers in carrying out the program of the two organizations.

We hereby extend greetings to all farm organizations and stand ready to co-operate with any organization wherein by so doing we can better agricultural conditions.

No. 2. WHEREAS, it is, and has always been the object of the Maryland Farm Bureau Federation to co-operate with the American Farm Bureau; be it

Resolved, That we give our unqualified endorsement to the resolutions as passed by the American Farm Bureau Federation in its convention held in Chicago, December 7, 8, and 9, 1931; and particularly recommend that this convention give special consideration to the following, which were passed by the American Farm Bureau Federation.

No. A1.—*The Agricultural Marketing Act.*

In enacting the Agricultural Marketing Act, Congress recognized the farm problem and gave to American agriculture a national farm policy. In its declaration of policy, Congress declared its intention that the act was designed to dispose of surpluses, to stimulate co-operative marketing of farm products, to make the tariff more effective on farm crops, to provide co-operative marketing associations with credit facilities more nearly comparable to those enjoyed by

other groups, and to establish a Farm Board to administer the act in ways to accomplish the above purposes.

Time and experience of more than two years in its operation, have demonstrated the inadequacy of the act properly to control crop surpluses and to make agriculture tariffs effective. The American Farm Bureau Federation has repeatedly stated, and still believes, to accomplish this purpose the equalization fee must be included in this act. We therefore insist that the present Congress amend the Agricultural Marketing Act by including the equalization fee or some other equally effective method whereby the cost of controlling crop surpluses would be borne by each unit of the commodity benefitted.

The American Farm Bureau Federation hereby expresses its willingness to support additional amendments that would give further power and authority to the Farm Board for the more complete carrying out of the policies of the act.

We pledge our continued support to the Federal Farm Board in all efforts put forth to administer the Marketing Act in such manner as will best serve the American farmer and urge that in the development and administration of co-operative marketing organizations, the general farm organizations be properly recognized.

No. A2.—*Rural Credits.*

It is imperative that substantial improvement be made in the existing credit machinery serving agriculture. Joint Stock Land Banks should be separated from the Federal Land Bank System. The Intermediate Credit Bank should be controlled and operated apart from the Land Bank. The Directorates of both should reflect a personnel representing the stockholders of such banks. The privileges of the Intermediate Credit System should be made available to agricultural co-operative purchasing groups. The debentures of the Intermediate Credit Bank should be made eligible for the note issue or collateral for borrowing by banks in the Reserve System.

Federal Land Banks should be furnished additional governmental capital of at least one hundred million dollars, such capital to be redeemed as operations might justify, and thereafter maintained in a separate revolving fund for the purpose of stabilizing the system when necessary by (a) the acquiring of additional capital stock, and/or (b) the purchase of Federal Land Bank bonds. Land Bank bonds should be made eligible for bank reserve investments. The capital stock of the Federal Land Banks should be held only by members of such banks and transfer of stock should follow loans.

The credit problem involves organization as well as legislative responsibility. The associational feature of the Federal Land Bank System should be preserved in building the agricultural credit structure of the country. To that end we recommend that all State Farm Bureaus include in their programs (1) the strengthening of existing local farm loan associations and (2) the organization, wherever necessary of new local farm loan associations, local agricultural credit corporations and credit unions. In order to serve co-operatively and more completely the credit needs of agriculture, we recommend to State Farm Bureaus that they give consideration to this type of credit and that credit unions be organized and properly integrated into our rural credit structure.

No. A4.—*Taxation.*

We reaffirm the entire series of resolutions on taxation as amended and approved in the 1930 convention at Boston. We commend the State and local Farm Bureaus for the leadership they have shown in attacking the problems of taxation in the various States and communities.

The present rapidly mounting delinquency in taxes, increasing destruction of property values by confiscatory State and local taxation, and increasing inadequacy of revenues for necessary public services are due largely to unsound systems of revenue.

Unsound systems of revenue, both Federal and State, are due largely to selfish financial, and political motives, which manifest themselves in wholesale exemption of many millions of our population of taxable capacity from any direct contribution to the cost of government, and in almost unrestricted competition instead of co-operation among the States and between the States and the Federal Government in matters of revenue. As a first step in correcting our unsound systems of revenue, we favor an Act of Congress providing for appointment of a special National Tax Commission consisting of representatives of every major national economic group and the foremost authorities on taxation, to consider and recommend sound and co-ordinated systems of taxation adapted to the needs of both Federal and State government.

No. A6.—*Grain Futures Act.*

The American public is being called upon for a return of confidence and to put forth every effort for the stabilization of American business, industry and agriculture. One of the greatest hindering influences to efforts being put forth in these directions is the continued system of short selling operating on the grain and other exchanges of the country. We favor such amendment to the Grain Futures Act as is necessary to give the Secretary of Agriculture full power and authority to regulate, and if necessary, to remove any further operations in short selling (except for legitimate hedging purposes) on the grain exchanges of the country.

No. A8.—*Relation of Farm Income to Expense.*

The prices of farm products have declined in recent years much faster than have the prices on most commodities which farmers must buy. The prices on machinery, tools and implements, fencing material, burlap, and various other necessary articles although showing in some instances small declines in prices are vastly out of line with the prices of farm crops. The board of directors and officials of the American Farm Bureau Federation are authorized and

directed to do everything possible to bring farm income and farm expenses into proper relationship.

No. A10.—*Tariff.*

The American farmers carry great responsibility for the maintenance of our protective system. If we are to continue this support, tariff schedules must immediately be revised to a basis of equalization as between agriculture and other industry.

We also insist that such changes be made in the flexible provision of the present law as will enable those responsible for its administration to make it operate effectively in emergencies.

No. A14.—*Postal Rates.*

In any efforts to balance the budget of the Post Office Department we oppose increased rates on first and fourth class matter. The deficit in the Post Office Department is caused largely by other classes of mail service. It is unfair to the main body of citizens who use the first and fourth class services of the Post Office Department, in which classes no material deficit is found, to impose the higher rates in an effort to overcome the deficit created by such other services.

No. A18.—*Membership.*

Recognizing that individual membership is the foundation of the strength and influence of the Farm Bureau whether county, State, or national; and realizing that the present distressed economic condition of agriculture demands a more determined effort for membership expansion, it is urged that throughout 1932 each State and each county organization make the matters of membership building and collection of dues of first importance; if necessary, curtailing other activities until these fundamental matters are more fully accomplished.

Recognizing further that membership increases result from the efforts of the individual member, it is urged upon

all units of the organization that activities be inaugurated to impress this fact on the minds of the present membership.

No. 2.—*Taxation.*

We approve of the appointment of a Maryland Tax Survey Committee and urge that they devote to this most important study all time necessary to the end that their report will be available on as early a date as possible. We herewith enumerate our recommendation:

a. That farm land and buildings be assessed as a unit, and that the assessment of buildings be based upon the value they add to the land and not upon construction cost or insured value.

b. That the assessment of frarm property should be lowered, so as to be comparable with the assessment on town property, owing to a great shrinkage in value of farm real estate. Adequate data, however, that would give a comparison of the assessed and sales values of farm and town property are not accessible. In addition few, if any, counties are keeping their records of assessments and tax collection in a manner that makes readily available the information showing the percentage of taxes collected from farm, as compared with village and town real estate. We therefore recommend that the Maryland Tax Survey Commission secure this information in each county and, lacking in authority or funds to obtain such data, that the Governor provide either or both. The appointment of the Tax Survey Commission is a step toward improving the tax condition in our State and we recommend that adequate funds be provided for it to carry on the work.

c. That there should be a uniform method of assessing woodland, and tax exemptions should be granted on those lands taken out of cultivation and given to reforestation.

d. That effort be made to bring about uniformity among the counties in regard to the method and time of collecting taxes, especially delinquent taxes. We feel that the assessment of property should be made by the highest type of

individual available, and the assessors should be selected on the basis of qualifications, and be free from political entanglement.

e. That greater State aid be given to the counties for the support of schools, thereby reducing the amount of county taxes on general property necessary for local school purposes.

f. That the State contribute to a greater extent to local county road building and maintenance, and that the gasoline tax and motor vehicle license funds be spent to extend better road facilities to the greatest number of rural people, building lower cost roads, where the traffic does not justify a large investment per mile, and furthermore, that the gasoline tax and motor vehicle license revenue be spent for road purposes only.

g. We recommend the State Legislature enact an income tax law with brackets sufficiently low to the end that the support of government shall be borne by those citizens who are not now contributing to the support of government, but are able to do so; and that the revenue from income tax supplement in part the tax now levied on general property, and that 50% of the revenue derived on the income tax be allocated to the counties.

h. We recommend that a sales tax on luxury commodities be considered as a means of raising additional State revenue.

i. That the inheritance tax, now in force in Maryland, which exempts property transfers to members of the immediate family, be extended to include the taxing of property transfers to such beneficiaries, but at a lower rate than is now applicable to more remote relatives, and that the transfer of property by gifts be taxed in the same manner as the transfer of property by inheritance.

j. We further recommend that the tax committee of the Maryland Farm Bureau Federation meet with the tax committee of the Grange and other farm organizations and,

should there be an agreement in principle with the foregoing recommendations, that a joint committee of all farm organizations make presentation of the recommendations to the Maryland State Tax Survey Committee and, failing to agree in principle that the secretary and tax committee of the Maryland Farm Bureau Federation present the recommendations in the name of our organization.

No. 3.—*Regulating the Sale of Oleomargarine.*

We recommend that Senate Bill No. 122, which was introduced at the last session of the Maryland Legislature and which dealt with the terminology and classification of butter substitute, also providing for sufficient revenue for enforcement purposes, be again introduced in the next session of the Legislature and every effort made to secure its passage.

No. 4.—*Co-operative Trucking.*

We recommend that the Maryland Farm Bureau, and our dairy interests, and all interested groups, prepare and introduce in the next session of the Maryland Legislature a bill which will give the milk producers the privilege to co-operatively transport their products to the market.

No. 5.—*Grades and Standards for Farm Products.*

Because of the fact that there is a tendency on the part of most States to enact uniform legislation to permit a more wide-spread distribution of various agricultural products and to enable the producers to co-operate to a greater extent thereby reducing the expense of distribution and eliminating a wasate of time, effort and money in the sale of various commodities: therefore, be it

Resolved, That this body urge upon the members of the State Legislature the passage of a bill designed to promote more economical methods of marketing farm products by authorizing the State Board of Agriculture to establish grades and standards and providing for inspection thereof of farm products both raw and processed and receptacles therefor, and to issue such rules and regulations in connec-

tion therewith that will enable our farmers to co-operate more effectively with producers in other States where similar legislation has been enacted, thereby reducing to as great an extent as possible cost of assembling, transporting and distributing products.

No. 6.—*Regulating the Sale of Cold Storage Eggs.*

WHEREAS, Section 215 of Article 43 of the Code of Public General Laws provides that the date when articles of food are placed in cold storage shall be plainly marked upon the container, or upon the article of food itself, and it further provides the date shall likewise be placed when the articles of food are removed from cold storage, and

WHEREAS, Section 217, Article 43, provides that all goods offered for sale after having been in cold storage for a period of thirty days, or over, shall be plainly marked "cold storage goods", and which said section is as follows:

"It shall be unlawful to sell, or offer for sale, any article of food which has been held for a period of thirty days or over in cold storage either within or without the State, without notifying persons purchasing, or intending to purchase, the same, that it has been so held by the display of a placard plainly and conspicuously marked "Cold Storage Goods" on the bulk mass or articles of food; and it shall be unlawful to represent or advertise as fresh any article of food which has been held in cold storage for a period of thirty days or over"; be it

Resolved, That the Maryland Farm Bureau Federation see to it that this law be enforced; especially in the sale of cold storage eggs, which are now being sold not in compliance to law and to the detriment of the producers and consumers alike.

No. 7—*Inspection of Measuring Devices.*

We recommend that the bill providing for the inspection of gasoline pumps, which was known as Senate Bill No. 195 and was introduced and passed by the Senate at the last

session of our Legislature but failed favorable report in the House Committee, be re-introduced so giving to our counties, under the supervision of the Commissioner of Motor Vehicles, the same protection as is now enjoyed by the buyers of gasoline in Baltimore City.

No. 8. We express our appreciation to the management of the Lord Baltimore Hotel for the capable and efficient manner in which they have entertained this convention, the Southern Hotel for the splendid banquet, the Association of Commerce, the Mayor of the City of Baltimore, and the Police Department for their co-operation. We also extend our appreciation to the press of Baltimore City and the counties for their helpful publicity.

Respectfully submitted,

COMMITTEE.

Secretary Payne read Resolution No. 2.

MR. MASSEY: I move the adoption of the resolutions.

The motion was seconded by Mr. Jones.

The motion was put and carried unanimously.

CHAIRMAN COHILL: It has been suggested that we pass on each paragraph of the taxation program.

MR. NUTTLE: I so move.

The motion was seconded by Mr. Lowe and carried unanimously.

SECRETARY PAYNE: Read preamble and paragraph A. No. 2. Taxation.

MR. MASSEY: I move the adoption of the preamble and the first paragraph.

The motion was seconded by Mr. Jones.

MR. COLEMAN: Why not use the word "demand" instead of "approve"—the second word in the first paragraph?

MR. CARROLL LOWE: It has already been appointed.

There being no further discussion, the motion was carried unanimously.

SECRETARY PAYNE: Read paragraph B.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Jones.

MR. T. A. MAYER: It seems more important to me that we pay on our ability to earn rather than compared with what the man in town pays.

SECRETARY PAYNE: The purpose of this resolution is that we shall know the facts.

Being no further discussion, the motion was put and carried unanimously.

SECRETARY PAYNE: Read paragraph C.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Lord and carried unanimously.

SECRETARY PAYNE: Read paragraph D.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Lowe and carried unanimously.

SECRETARY PAYNE: Read paragraph E.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Jones and carried unanimously.

SECRETARY PAYNE: Read paragraph F.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Jones and carried unanimously.

SECRETARY PAYNE: Read paragraph G.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Nuttle and carried unanimously.

SECRETARY PAYNE: Read paragraph H.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Lowe.

MR. HURLOCK: What is a luxury?

SECRETARY PAYNE: Well, anything that does not enter into the necessity of life is considered a luxury, and that is a pretty broad field. We have considered luxury taxes in the past as being taxes on tobacco, perfume, cosmetics, all articles used by those people whose revenues are sufficiently large so they can enjoy things people ordinarily cannot enjoy. You will note this says "consideration is suggested."

MR. HURLOCK: That wouldn't be considered on any food?

SECRETARY PAYNE: Necessary foods are not luxuries.

MR. HURLOCK: There are some foods that might be considered luxuries.

MR. HARRY: Some southern States where tobacco is grown are using a luxury tax on tobacco, Tennessee, for instance. The consumption of tobacco has increased very rapidly during the last few years. Another luxury tax which is used by a good many States is the tax on theatre tickets. Tobacco and theatre tickets are two principal luxuries, also cosmetics are being taxed in several States.

SECRETARY PAYNE: Is that explanation satisfactory?

MR. HURLOCK: Yes.

There being no further discussion, the motion was put and carried unanimously.

SECRETARY PAYNE: Read paragraph I.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Jones and carried unanimously.

SECRETARY PAYNE: Read paragraph J.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Lowe.

MR. ANDERSON: Mr. Chairman, we have an opportunity that has never been given us before to really present our tax situation to a wise body to make suggestions to our next Legislature. I think our resolution to a large degree is fulfilled in our situation as it should exist, except that I would like to suggest that we be a little more specific as to how we get a committee who will appear and present the farmers' situation before this commission.

My suggestion is that the Farm Bureau organization in each county select a man, a property owner and a Farm Bureau member, who would form themselves in a committee headed by our State secretary and the president and our vice-presidents, to confer on methods and means of presenting this proposition. Such a committee would not only have information when they go out, they will be in a position to bring information back to the various counties and organizations.

This committee will not only wait upon the Tax Commission, that they can render assistance to the officers of our organization at any legislative session, before any of the committees, appear before them. I would like to make that amendment, if you so call it, and if necessary, get more expression on it and have a rising vote so we will know that this situation and our condition can be widespread. I repeat, it will be a means of information going out from home, and information coming back home. I therefore make that amendment.

MR. MASSEY: Mr. Anderson, I will ask Mr. Payne to explain this to you. We expect this to be worked out. Maybe his explanation will clarify it for you.

SECRETARY PAYNE: The gentleman from Frederick county is voicing a written resolution which was given

consideration by the Resolutions Committee. We felt that we had advanced far enough to apply the principles of organization and I mean by this that the gentleman from Frederick county has a director elected from that county into the State Federation, and therefore the opportunity to voice their opinions; subject to the majority of the Board.

We have attempted in this resolution to suggest to this body that we as a body treat with all other bodies who in turn are voicing the sentiments of their membership. If I may impose my individual opinion in the matter, only through organization, diminishing the number of representatives as far as possible when such presentations are to be made can we hope to make our case clear; be sure however, that you represent your constituents.

That is all embodied in this resolution. The only point on which this committee is differing from Frederick county is that we feel when they send their director, that their director has available at all times the information. He is, however, subject to the opinion of the majority of the directors on that committee.

MR. ANDERSON: May I ask how many State directors, county directors are on that committee?

SECRETARY PAYNE: The committee has not been appointed. Or do you mean on the resolutions committee.

MR. ANDERSON: No, on the tax committee we propose to appoint. As I understand it, this committee has not yet been appointed. My thought, Mr. Chairman, is to make the influence of this throughout our State as wide as possible. As I stated at the beginning, this is the first opportunity we have had to really get information from home and to return it home as to how our requests are being treated. I think the time is ripe for us to really set up some machinery which will be widespread. We have passed resolutions year after year. As my predecessor, Professor Burkee stated, not referring to this State organization but all farm

organizations, we pass resolutions which read nicely, they are turned over to some one else, we have no information, no means of information from year to year as to what is going on. So I for that reason made this recommendation, that we really give each board of directors a voice in this matter.

SECRETARY PAYNE: Mr. Chairman, could I suggest to the gentleman that probably an amendment could be made to this effect, that upon the appointment of the tax committee by the president of our organization, that the pertinent points be immediately sent back to the county representatives, that their board of directors might have the privilege of discussing and giving back their reaction to the State committee.

In other words, I am only suggesting that between the meetings of the board of directors that your State tax committee would be obligated to immediately make a report back to the county organizations, and you handle it with your board of directors. I would think that would give you the information.

MR. ANDERSON: About how many members would we propose to put on this committee?

SECRETARY PAYNE: Our minutes read that our president shall appoint a tax committee. The point was purposely avoided as to the number. I think our president has in mind the men who go on that committee are to be men who to as great degree as possible, will have had experience, and will have had some degree of training in the economics which must go into the consideration of a question of that kind.

MR. ANDERSON: Will they be active farmers may I ask? This is our opportunity, Mr. Chairman. We are not going to have another, for at the meeting next year it will be too late. The Legislature will be in session.

SECRETARY PAYNE: I will answer by saying that one of the qualifications of membership in this organization is

that he must be a farmer, and that this committee will be composed of Farm Bureau members.

SENATOR HARRY: Mr. Chairman, I am sure the next Legislature will listen a great deal to this tax commission which has been appointed. As a member of a similar committee from the State Grange, we have prepared. Dr. DeVault, a member of the commission, was a member of our committee, and I believe he was very sympathetic, and he knows more about taxation than any man I know of. That report is available. The Montgomery County Extension Service promised, and has already made up several copies of that, and it will be available to this committee or whatever other use the Farm Bureau wants of it. I think there are about 25 copies now available, and if anyone wants a copy of it they can have it.

MR. CARROLL LOWE: I am wondering about that tax committee. I think it will be one of the most important committees we will have, whether that is going to go far enough. I presume that the president will have latitude enough to furnish them with the necessary ammunition to carry on, because I think that is going to be our main work in this next two years, is prosecuting this tax program. Therefore, that tax committee will be very, very important.

CHAIRMAN COHILL: The gentleman from Frederick county offered an amendment.

MR. ANDERSON: Yes, an amendment or an addition to the resolution.

SECRETARY PAYNE: There has been an interchange of thoughts and suggestions. Will Mr. Anderson now dictate his amendment?

MR. ANDERSON: It is merely that this committee shall be selected by the directors of each county organization.

SECRETARY PAYNE: Your suggestion is that the whole board of directors will be your tax committee?

MR. ANDERSON: I beg your pardon, that they select one man, a farmer, a Farm Bureau member, who will be, we shall say, given the powers of conferring with the officers of the Maryland Farm Bureau Federation.

CHAIRMAN COHILL: As I understand it then, instead of the president of the Maryland Farm Bureau Federation appointing the committee, you want the county farm bureau directors to do it?

MR. ANDERSON: The farm bureau organizations in each county, the directors of each organization appoint a man and send him up, one man from each county.

MR. NUTTLE: It seems to me this is a matter of the manner of appointment of this committee. Mr. Anderson's point is that the committee should be appointed by the directors in each county, that is, each of the counties that has a Farm Bureau should appoint one member of that committee. I think the idea in this resolution is that the president of the Maryland Farm Bureau should appoint that committee. My idea is this, that it might be well for the president to appoint a member from the county, but send that appointment or suggested appointment down to the local Farm Bureau for action. If they did not approve that appointment, then he could appoint another man.

I think you will get a more workable committee that way. You go to pick 20 or 22 or 23, whatever you have all over the State without reference to the makeup of the other counties, and possibly the local men would not be in touch with the work that is to be done. They may know the conditions locally, but not State-wide. I think it would be a more workable body if the president should make the appointments with the provision that the directors of the county should approve those appointments. That is workable.

MR. ANDERSON: I will go along with that, Mr. Chairman.

MR. COCKEY: I will second the amendment.

MR. ANDERSON: I will withdraw my motion and substitute this one.

SECRETARY PAYNE: The gentleman from Caroline county will have to repeat his amendment.

MR. NUTTLE: As has been suggested, probably a committee the size Mr. Anderson has suggested would be unwieldy. I think each county should be represented, but possibly an executive committee would do the majority of the work anyway.

My amendment is that the president appoint this committee with the requirement that the appointee from each county be submitted to the directors of that county for confirmation.

MR. ENSOR: The only question I have in mind, Mr. Chairman, is it seems to me that the resolution that is offered here might—the one offered by the committee gives ample room or latitude for any director in any county to do the work that Mr. Anderson sets forth. It certainly assures the director of the county speaking for the people of that county when he speaks in the board of directors of this State Farm Bureau. My opinion is, if you amend your resolution here or offer a substitute, that you leave room for a committee—in other words, it sets forth and instructs the Farm Bureau to appoint a committee from each county, which perhaps will be 15 or 18 members, and I am of the opinion that no committee of that size is going to be successful in studying this tax problem of this State. There is going to be considerable expense attached to the larger committee, and you will no doubt have difficulty in getting a quorum, and in my opinion, there are a great many objections to it. I am of the opinion it should be left to the directors of the Maryland Farm Bureau to work out.

SECRETARY PAYNE: Mr. Chairman, may I offer a suggestion? Could you not even interpret this without disturbing it as an obligation on the part of the president that when matters of taxation will be reported back by the tax

committee, that your director will be privileged to bring anybody in from the counties that wants to come, and then your director can voice your sentiments in the board of directors' meeting.

Senator Ensor has told you what has been the experience in matters of legislation. Senator Nuttle has told you the same thing. Senator Harry has told you the same thing. Here are three men who have had experience. You will just have to follow out your principles of organization, that is, that your leaders will speak for you. If you increase the size of your committee, you decrease their efficiency. Your county must be militant, and at all times prepared and willing to contribute advice and counsel to your leaders and abide by the decision of the majority.

The thought I get, if you think that any concession that your State officials can give you will stimulate just that interest and just that support in the way of suggestions that we are always looking for, I think we can violate most any principle. But I am satisfied this resolution can be interpreted as it stands now to give to any county in this State the opportunity of voicing its opinions before any move is made in the way of presenting our recommendations to the State Tax Survey Commission.

MR. ANDERSON: Mr. Chairman, we have a motion before the House that has been seconded.

MR. NUTTLE: Mr. Chairman, may I say my only idea was to try to bring harmony here. If Mr. Anderson is willing to go along, I am perfectly willing to withdraw my amendment. I just wanted to work out a harmonious scheme.

MR. ANDERSON: I withdraw in your favor. If you are going to withdraw, I will have to repeat the words I started out with, that we ought to make this thing far reaching. This is our opportunity. We never had one before like this, and we will never have another. We are making no reflection upon our State body. We want to work with them. We want the influence to be widespread. I don't think you

are going to be over-burdened with numbers, but I think our folks agreed at home that they want to know what is going on. We want to give them an opportunity.

MR. MASSEY: Mr. Chairman, may I reiterate what Mr. Payne has just said, that you have all the opportunity in the world to present your viewpoint at the Farm Bureau directors' meeting.

CHAIRMAN COHILL: I would like to make one suggestion. Our president, Mr. Davis, has assured us that Frederick county will have one member on that committee.

MR. ANDERSON: It is not Frederick county particularly, we want all to have some knowledge.

SECRETARY PAYNE: We will now vote on the amendment offered by Mr. Nuttle, and seconded by Mr. Cockey, that the president in appointing the tax committee will submit the names of his appointments to the counties for confirmation.

CHAIRMAN COHILL: That is an amendment to J.

MR. MANN: That means it will go on just the same, but will be confirmed by the directors. In case these appointments are not confirmed when they go back and it has to go through again, what is going to happen then?

CHAIRMAN COHILL: I still insist you are violating the principles. You are going to have your board of directors as your tax committee, and it is going to cost you ten times more, and it is not going to be as efficient. There will be postponements of the discussions, and it will not be an effective demonstration of what your opinions will be at the time.

We will vote on the amendment. Is there any further discussion? We will have a roll call, if that is your wish.

MR. COCKEY: I so move.

The motion was seconded and carried unanimously.

Roll Call. Result—36 noes and 11 yes—the motion is lost.

CHAIRMAN COHILL: The vote is eleven for and thirty-six against. The amendment failed. Now we are ready for any further discussion on the original motion.

MR. ZENTZ: I voted against the amendment for the simple fact that my experience has told me that all committees should be small, but go with your guns loaded. We want this to be effective, and we want results, so in appointing this committee I certainly do hope that you will have men who have the interests at heart of the farmer, and will go along and do something, and not come back home, but stay until they get results. My experience has told me that a small committee is very much more effective than a large one. That is the reason I didn't vote with my delegation, but I assure you, Frederick county will be a hundred per cent with you.

CHAIRMAN COHILL: Is there any further discussion? If not we will vote on the original resolution.

The motion was put and carried unanimously.

SECRETARY PAYNE: That concludes the tax program. You have voted on each paragraph of the tax program. Now you may wish to vote on the resolution as a whole.

MR. MASSEY: I move we adopt the resolution on taxes as a whole.

MR. LOWE: I would like to second that, and say I think we have here a program of taxation outlined which we can all get behind. If we get behind it to the fullest extent and take this back home and build up sentiment in the next year, we will really have accomplished something.

The motion was put and carried unanimously.

SECRETARY PAYNE: I feel this program is the most constructive tax program which has come out of a farm organization for twenty years, saving the one by the Grange, which is practically the same, and which I think these two organizations can get together on.

MRS. WILLIAMS: Some man up here says he never knew a woman to say anything. Well, I am going to tell you something about taxation. I went to the editor of the *Kent News* of Kent county last Saturday, and while he doesn't appear in the political arena of the county, he is a big wheel, and he said to me, "I can't do anything," and it wasn't so, and I told him so.

I said, "You can give us your moral support."

He said, "The farm organization or some big organization must do something about this taxation," and I want to say to all of you men and all of you women, and especially to Frederick county, that when you get back home, still be a farmer. Don't be a Democrat nor a Republican. (Applause). And when women come to your County Commissioners and ask for a few dollars for something that helps along in their county, however superfluous it may appear to you, don't say that women are keeping your taxes way up when you have political plums in your court house that you should have done away with long ago, when your county officers should attend to their own business instead of having three or four jobs and having to have a secretary and several other paid people to take care of it. Go back to the seat of it, and then you are going to get relief. But neither the Farm Bureau nor the Grange nor any organization under God's heaven can do anything for you until you do something for yourselves. (Applause).

SECRETARY PAYNE: Read Resolution No. 3. Regulating the Sale of Oleomargarine.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Cohill and carried unanimously.

SECRETARY PAYNE: Read Resolution No. 4. Co-operative Trucking.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Jones.

MR. LOWE: Mr. Chairman, I don't like that phrase "Baltimore market." They are transporting milk in other sections of the State also, not only in the Baltimore market. I move that be stricken out and just leave the word "market."

The motion was seconded by Mr. Jones and carried unanimously.

MRS. HARRIS: Is there any discrimination against other products besides milk?

SECRETARY PAYNE: I will answer the question according to my report made on Tuesday, that we have taken care of other products.

SECRETARY PAYNE: Read Resolution No. 5. Grades and Standards for Farm Products.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Lowe.

SECRETARY PAYNE: I wish to add, as I said in my report, that we know that the whole problem of better farm prices is pretty nearly on better quality. It was explained here this morning, and we know that if you are going to produce better produce, you want some one to be the judge. You have got to have it. You know Maryland demonstrated that they are not ready to accept it. Our policy is that before we do anything it has to go into every community that is interested and they can thresh it out, just as I suggested to my good friend Anderson there. If we don't represent the farmer, we are not on the job. Our job is to represent him.

CHAIRMAN COHILL: Is there any further discussion?

MR. ZENTZ: Where will these inspections be made?

SECRETARY PAYNE: Just as explained by Mr. Shaw this morning, the inspections will be made for the canning crops at the cannery.

CHAIRMAN COHILL: As a fruit grower, I will say we had a case this fall where we had a carload of apples that was bought to be No. 1 U. S., so much per barrel loaded on cars. We shipped two carloads and they went through all right because the weather when we were picking and packing and while the cars were on their way was cool. On the last car the weather was quite warm when we were picking and packing, and we telegraphed to the buyer and suggested that that car of apples be iced. It wasn't our car of apples, it was theirs as soon as it was loaded on the cars. They made no reply. The next day we telegraphed again. No reply.

The car went through. The weather was very hot, and they rejected the car, but it had been inspected by the U. S. Agricultural inspector, and we just telegraphed them that we were forwarding the certificate from the inspector, and they took the car and paid for it. That was their own fault. But if it hadn't been for that inspection we would have lost that car of apples.

Is there any further discussion?

MR. MERRITT: I was one that opposed that bill when that inspection bill was brought up. We are in favor of inspection at the farms or markets, but to leave that inspection until after the load of produce is sold and that inspection has taken place, we all objected to that.

SECRETARY PAYNE: Any bill we sponsor in the Legislature will be acceptable to you, for producers will be given the opportunity to say just what they want.

MR. MERRITT: I am in favor of inspection.

SECRETARY PAYNE: What kind of inspection is used is for us to determine among ourselves.

CHAIRMAN COHILL: Our inspection is made when it is loaded on the car, or if we ship by truck, it is inspected on the truck.

MR. MERRITT: That inspection in Baltimore is a little different than what you have. Our produce is hauled by

trucks to market and generally sold there, and the packers after that load of produce was sold and delivered to their packing house, then wanted it inspected there. That is what we are objecting to.

CHAIRMAN COHILL: The inspectors are on the job all the time. They also inspect the fruit in the cars—open the barrels and baskets.

MR. HALL: I want to speak as Mr. Merritt did there. I think we want an inspection at the farm, not after it is delivered. It was suggested last year that a certain number of packages would be taken off the truck and poured on the table and culled over. There were trucks standing outside some of those packing houses in Baltimore, I will say as many as fifty, so how are we going to inspect in the packing house when they are making a warehouse out of our trucks?

SECRETARY PAYNE: You will find our good friend, Mr. Derrick, in Baltimore county, our good friends the county agents in other counties will see that those interested in this, every one that has an opinion on this question, will be given the opportunity to express it before this organization.

CHAIRMAN COHILL: I believe he can have his vegetables inspected wherever he pleases if he pay for it. We paid for those inspectors to come around and inspect our fruit.

MR. MERRITT: In this case the packer pays for it and inspects it.

CHAIRMAN COHILL: If you want it inspected at your home and pay for it, I don't see why the Department wouldn't furnish the people. We have about 200 inspectors in our county. We pay their board and pay them per diem.

MEMBER: We are passing on a resolution to have inspection, regardless of where it would be.

SECRETARY PAYNE: We are passing on a resolution endorsing the principle of inspection. It wasn't our hope

to bring out at this meeting what those standards would be, or the methods.

The motion was put and carried unanimously.

SECRETARY PAYNE: Read Resolution No. 6. Regulating Sale of Cold Storage Eggs.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Nuttle.

MR. LOWE: Mr. Chairman, on whom is the burden of enforcement of that law?

SECRETARY PAYNE: It is a public general law of Maryland, enforcible by the Health Department of the State.

MR. LOWE: In other words, they want to have detectives swear out a warrant?

SECRETARY PAYNE: No, the resolution suggests we prevail upon the authorities to enforce the law.

MRS. HARRIS: What degree of cold constitutes cold storage?

SECRETARY PAYNE: I have taken this bodily right from the public general law of Maryland. Different States have different degrees of temperature.

MRS. HARRIS: A good many eggs in the City of Baltimore are consumed in hotels and in restaurants. Those people may get their crates of eggs stale and put in cold storage a certain date, but when the ultimate consumer gets the egg on the table, it doesn't show that it is a strictly fresh egg.

The business of the farm women in Maryland is primarily growing poultry and eggs, and there are lots of men in the City of Baltimore who would willingly pay two cents more or possibly five cents more for their eggs in the morning if they knew that the eggs were only two or three days old. They can't tell it. The cold storage cases are marked in a

good many instances, the eggs are marked when they went in cold storage, but you never see the crate from which the egg came any more than you ever see the hen that laid the egg.

There ought to be some way to overcome that. There are signs in most restaurants "Not responsible for hats and coats." Well, right above that should be a sign "Not responsible for the length of time eggs lie in cold storage."

The cold storage eggs are good eggs. Cold storage chickens taste all right, cold storage turkeys taste all right. Yet, there are people in the cities who are fastidous enough to be willing to pay extra if they knew they were getting the stuff absolutely fresh, and it seems to me the bill you have fixed up here would only go on the crates of eggs or crates of chickens, and the people who eat them and pay for fresh eggs and chickens don't know whether they are getting them fresh or otherwise.

So it seems to me there ought to be something done about it. I am not smart enough to know exactly what should be done, but there ought to be some way in which the consumer will know as well as the man who buys for the restaurant or for the hotel, will know what he is getting.

There being no further discussion, the motion was carried unanimously.

SECRETARY PAYNE: Read Resolution No. 7. Inspection of Measuring Devices.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Nuttle and carried unanimously.

MR. NUTTLE: Before we come to No. 8, I have a suggested resolution which would come up under taxation, Item K. This comes out of the thought that occurred to several of us after Mrs. Williams made her statement a while ago. Personally, I am from a county where I believe we have as fine a board of county commissioners as we have ever had, and yet, no matter what county you are from,

there are certain economies which we believe can be brought about in county administration if we put pressure upon our boards, if we put it on without regard to party lines, if we bring it up just as a mere citizen.

I don't know whether this will meet the ideas of some of the other members of this body here who have made suggestions; they just asked that I draft a resolution which would give the members of the Farm Bureau, bring to their minds the opportunity they have of not forcing but of putting upon their local boards the idea of cutting out some of the superfluous jobs. They are good in some degree, but we could do without them in these times, and some of the other things that possibly could be cut out. Here is what we drafted:

"Taxation, Item K: In view of the increasing burdens of taxation, we urge upon the county commissioners of the various counties the strictest economy in our local expenditures, and pledge the co-operation of our Farm Bureau members in applying political pressure where it can be applied to bring about such economy."

MR. COCKEY: I second the motion.

MR. PIERCE: It depends on what has been superfluous. As has been cited at one of the meetings here, they were cutting out their county agents and home demonstration agents as a means of economy.

There being no further discussion, the motion was put and carried unanimously.

SECRETARY PAYNE: Read Resolution No. 8.

MR. MASSEY: I move the adoption of the resolution.

The motion was seconded by Mr. Jones and carried unanimously.

MR. MASSEY: I now move the adoption of all the resolutions as a whole.

The motion was seconded by Mr. Jones and carried unanimously.

CHAIRMAN COHILL: The next is the election of officers. The secretary will read the report of the nominating committee.

SECRETARY PAYNE: I am happy to report to the convention that the board of directors has placed in nomination Mr. James W. Davis, of Rocks, Maryland, as president, and E. Thomas Massey, of Kent county, as vice-president to succeed themselves. (Applause).

CHAIRMAN COHILL: Are there any further nominations? If not, a motion to close the nominations is in order.

MR. LOWE: I move the nominations be closed, and the secretary cast the ballot for the candidates nominated.

The motion was seconded by Mr. Jones and carried unanimously.

SECRETARY PAYNE: I am happy to cast the ballot for the voting delegates of this convention for James W. Davis as president, and E. Thomas Massey as vice-president. (Applause).

PRESIDENT DAVIS: Mr. Chairman, Fellow Farm Bureau members: I am just going to tell you the same old thing I have always told you before, that I haven't any speech, but I will say that I will give the very best I have in me to advance the interests of the organization, to co-operate with the other organizations such as the Grange, the Maryland State Dairymen's Association, the Interstate Association, the Tobacco Growers' Association, the Extension Service, and any other organizations in the State.

Any measure of success that we have had in the past year has not been due to any one individual, but it has been due to the co-operation of all other interests in the State. That is an end we have labored towards for a good many years. We have felt that the State was small, that local jealousies and antagonisms had no place among the agriculturists of the State, but if we would all work together

towards a common end, I feel there is a bright future before us.

I think that we have an opporunity to carry on and do a much better job in the future than we have done in the past, because as you farmers know if you have ever gone out as I have done with a six-horse team, when they have been standing in the stable for a while, maybe some of them were green mules, and you had to break them in and get real teamwork out of them, you had to work them a while and get them used to pulling when they were all called on to pull and all pull together.

Now I think we have come to that place in agricultural organizations in the State. I think we have gotten to the place where we can all talk the same language and all labor more earnestly to do the same job, and that job is just anything that is going to make things better for the farmers. (Applause).

SECRETARY PAYNE: I have been too busy to check up on our banquet last evening, and I want to thank you for the way you co-operated because of the limited room. I think everything else was all right.

MRS. WILLIAMS: May I say something more? We appreciate Mr. Payne's trouble, appreciated the banquet and the meal, but I say, just after passing a resolution on cold storage stuff, we were stung last night on our turkey. I have been talking to the Lord Baltimore Hotel about turkey. I don't want to sell the turkey for any Maryland Farm Bureau banquet, but I do think we should insist on fresh turkey, and Mr. Payne told me when I asked him about it before he planned the menu, he said, "They are going to give me domestic turkey."

I'll be switched if they didn't, because "domestic" means "not wild", and age generally goes with wildness, unless you have attended a Democratic banquet! (Applause).

PRESIDENT DAVIS: I think we shouldn't close this convention without having a few words from our vice-president.

He is just carrying this load as much as any of us, and certainly does his part, and I am mighty glad that he is to go along with us again another year. I think we should hear from Mr. Massey. (Applause).

MR. MASSEY: I thank you very much for this honor again. During this convention I have seen a good deal of enthusiasm and I was just thinking if we could take this enthusiasm back to our counties, and in doing so, realize that we are only 33 1-3 per cent organized in the United States, and consequently, being so imperfectly organized we are only getting 17 per cent of the national income, when we should be getting 33 per cent. We are told that if we are 60 per cent organized at least, that we could at least change our income, that is the national income, or the proportion of the national income from 17 to 33 per cent.

We shouldn't lose our enthusiasm when we leave Baltimore. I, for one, pledge my whole being in reorganizing my county next year, or this year, to try to get a larger percentage of the farmers into the organization than we have ever had before. If all of us would do it we can come back to Baltimore in our next convention and be satisfied that we have worked towards an end.

And just remember, that organization is the only thing that is standing between us and getting our proportionate national share of income. (Applause).

DR. SYMONS: Mr. Chairman, I don't believe this convention can adjourn without one and all expressing our appreciation to our most efficient officers, and particularly to give a rising vote of thanks to our secretary, Mr. Payne, who has taken the burden of putting this fine convention across. I move that.

Rising vote of thanks to Mr. Payne.

PRESIDENT DAVIS: I just want to say we are going to adjourn. We have had a mighty good convention, a lot of enthusiasm, but don't let us go home and fall flat. Let us

make up our minds we are going to come through this year with a bigger, stronger, better Farm Bureau than we have ever had.

The meeting is adjourned.

The meeting adjourned at one-ten o'clock.

PROCEEDINGS
of the
Maryland State Horticultural Society

TUESDAY MORNING

January 5, 1932

COLLEGE PARK, MARYLAND

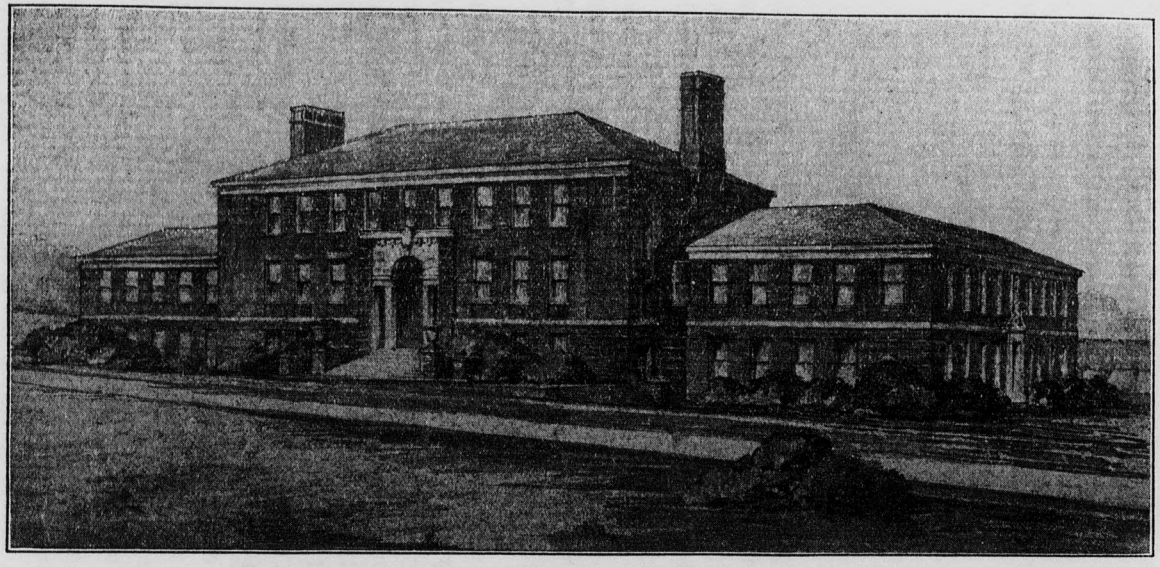
The First Session of the Thirty-fourth Annual Meeting of the Maryland State Horticultural Society, held in the Horticultural Building, College Park, Maryland, convened at ten-thirty o'clock, Mr. G. S. L. Carpenter, President, presiding.

PRESIDENT G. S. L. CARPENTER: The meeting will come to order. We will ask our Assistant Secretary, Mr. A. F. Vierheller, for his report.

MR. VIERHELLER: I have no formal report. I am going to give you the high points of what has been done by the Secretary in the past year. Last year we made several resolutions. Among these resolutions was one on "Apples for Health," where we agreed we would put in so much money if the other societies would do the same thing, but we didn't hear any more about "Apples for Health," so there was no action taken on that matter.

Another resolution adopted was to thank Governor Ritchie for his assistance in getting this new building. I sent the Governor a copy of the resolution, also a copy of the Annual Report containing the resolution.

Another resolution was in regard to early publication of our Annual Report. I took that matter into consideration, and through co-operation all around we were able to get this report out by April 6, which is a little earlier than usual.



NEW HORTICULTURAL BUILDING, UNIVERSITY OF MARYLAND

Dedicated under the auspices of the Maryland State Horticultural Society in their Thirty-Fourth Annual Meeting at College Park, January 5, 1932.

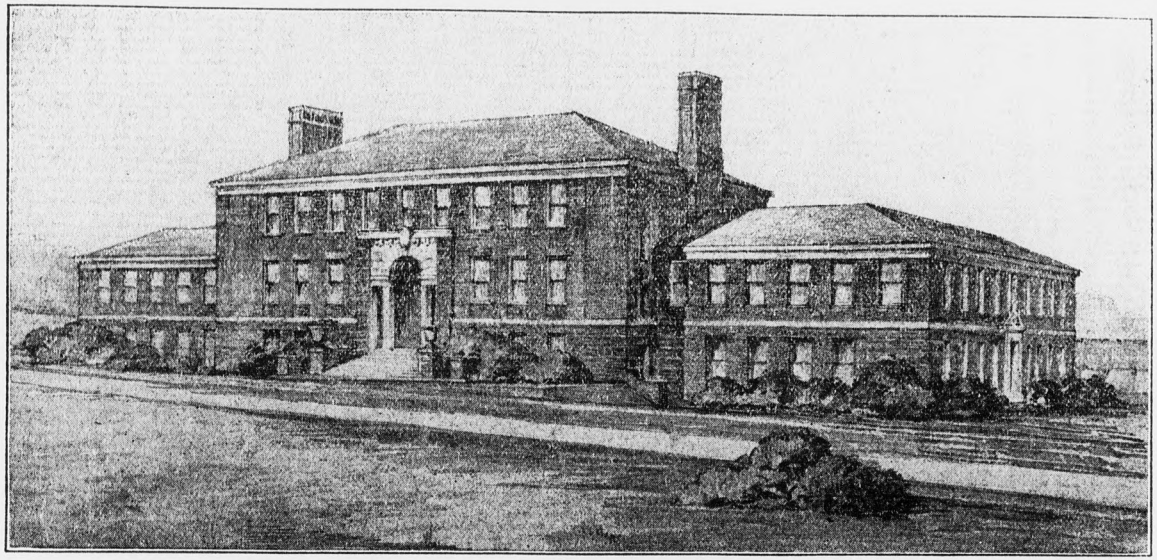
There are some new departures that have come up in the Society the past year. I have always felt we should have a little more co-operation among Horticultural Societies all over the country, and I took it upon myself to write every Society in the United States, and I think every active Society replied. We are exchanging our annual reports, and also any other publications that the societies put out. I have used some of their articles in the past few issues of the *Maryland Fruit Grower.*

Coming to our news letter, I suppose you all know the *Maryland Fruit Grower,* which was published last February for the first time and is now in its eleventh issue. It is not perfect by any means, but it is a little better than the old mimeographed sheet, and we have been trying to get some of the best papers possible in each month's issue. We are sending out over 450 of these reports, *The Maryland Fruit Grower.*

There has been quite an increase in the correspondence of the Society. We seem to be on the map so far as societies go. It is an indication, I think, that the fruit growers over the country are beginning to get a little closer together and talk things over among themselves. I have had letters even from Oregon on spray residue, etc.

In regard to rate cases, while we haven't been on record in the newspapers as being really active, our President has just come back from New York, where he participated in a conference on the reduction of export and domestic fruit rates, especially the export rate. This case has been carried on very actively by Virginia, West Virginia, Pennsylvania, Maryland, and New Jersey.

I might say a word about our summer meeting at Hancock on July 22. It was said to be one of the best that we have ever had. There was no speech making, but we visited about everybody in that part of the country, and had a full, busy, instructive day. We saw irrigated orchards, new packing houses and fruit washers working, and various



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experimental plots on color and irrigation of fruit, and we visited various other orchards and saw a lot of instructive things. I think it is only right that we should at this time acknowledge the kindness of the various growers, especially Messrs. Cohill, Carpenter, Casper, Daniels, Scott, and Dillon. They all worked together to make the day one of pleasure and profit.

The membership of the Society at the present time, paid up, is 177. We have various members who have been in and out the past several years, numbering 94. This membership is not what it should be, but we are hoping, by improving *The Fruit Grower*, the monthly news letter, and our annual report, annual programs, summer meetings, to put the Maryland Horticultural Society up where it belongs, and we are proud of the progress that has been made.

PRESIDENT CARPENTER: Fellow Fruit Growers and Friends: At this, our thirty-fourth annual meeting, we are confronted with problems so serious as to threaten the future existence of our industry.

Each year our efforts as a Society have been devoted almost exclusively to education. We have secured the best men in the country to talk to us on the subjects causing us difficulty in the past year.

Through the efforts of our Society, and with full co-operation from everyone, Governor Ritchie included in his budget the funds necessary for the erection of this building, which today is being used for the first time. Each room has been carefully designed for its part in the education of the commercial growers of all branches of our horticultural industry. Special laboratories for the research work, so vital to the future development of our industry, have been provided for the fruit, canning, and floral industries and for nursery and ornamental horticulture. In addition, the classrooms and laboratories for the development of the student have been planned with the same thought and care.

Horticulture, for the first time at the University of Maryland, has a building devoted exclusively to its needs.

Today the economical condition of our growers is so serious that it seems wise that our Society undertake a careful study of our present situation.

This summer our peach industry, which depends on our domestic markets for outlet, suffered from an over-production of fruit, much of which was of inferior size.

At the present time our apple industry is meeting with the most difficult marketing conditions ever experienced. The industry was never in its entire history confronted with so many tariffs, embargoes, total or partial, or restrictions, as it is today; and they are steadily increasing instead of diminishing.

Exports to England, Scotland, Wales, Irish Free State, Belgium, France, Holland, Denmark, Roumania, Poland and Germany must be free from spray residue and apple maggot. Vigilant policing on our part is required to avoid further action.

England, Scotland, Wales and the Irish Free State allow only fruit of No. 1 quality or better to be shipped between July 1 and November 15 of each year.

The Argentine established by a decree such drastic import sanitary restrictions that the movement of fruit from our section was seriously curtailed.

Poland, Roumania, Peru and Japan have a total embargo against us, and the Agrarians and Hitlerites in Germany head a strong movement to embargo us completely there.

Heavy duty and tariffs have been recently set up against us in many countries.

The Belgian duty on apples in baskets was raised on December 10 from 5 to 25 francs per 100 kilos. A kilo equals 2.2 pounds.

France has a duty of 7½ francs per 100 kilos, but a bill is now pending to quadruple this.

Holland has a duty of 8 per cent. based on valuation.

However, Holland advises, because of our tariff and bulb quarantines, we can expect a duty raise.

Germany has a duty of $1.00 per barrel with probable increases.

Sweden has a duty against us of $1.98 per barrel.

Norway, from August to January, has a duty of $4.94 per 100 pounds plus surtax of $2.47 per 100 pounds; balance of year, $2.47 plus $1.23 surtax.

Denmark has a duty of 60 cents per barrel.

Finland has a prohibitive duty of $10.00 per barrel.

Poland has a duty of $1.52 per barrel.

Canada has a sliding scale tariff based on valuation fixed by order in council amounting to approximately 30 cents per bushel and 90 cents per barrel.

The Argentine, a duty raised from 7 to 32 per cent.

Most serious of all to us would be a tariff against apples from the United States, which is contemplated by the British Government in which preferential treatment for the British commonwealth of nations is provided.

I believe that these tariffs, embargoes and restrictions, which have been placed against our apples, are a direct result of the tariffs, embargoes and quarantines used by our Government to protect certain of our industries. Yet we cannot blame any of these Governments who have used our procedure as a basis for their own. Certainly it is retaliation, but can we blame the Argentine, when her grapes, cattle, turkeys and corn by embargoes or quarantines are totally or partially restricted in their movement to our country for issuing similar decrees against us?

Added to these trade barriers, we have a decreased buying power abroad and a depreciated exchange. Many countries have gone off the gold standard. On January 2 the pound was worth $3.40 instead of $4.86. In Denmark, Norway and Sweden, the value of the kroner averaged 18.7 cents instead of 26.8 cents, and in the Argentine the peso is worth 23.75 cents instead of 42.44 cents.

Our apple industry has been developed to supply the world's markets and is seriously in need of all outlets. In 1926, that was a disastrous year, yet we exported more than 7,000,000 barrels of apples. This year, to December 19, we have exported only 1,573,904 barrels, 735,704 less than 1930, a year of low production.

Of course, it follows that the fruit which we cannot export will be offered on our domestic markets for sale, though much of it is not suited for this trade. At the present time wholesale prices on apples, according to Government reports, are the lowest that they have been since the records were first kept in 1910.

For many years we have been improving our laws for the standardizing of our pack of apples. This year our movement of graded fruit has been curtailed by the heavy volume of unclassified fruit distributed in bulk and in packages by trucks and rail to all areas. We face the loss of much of the benefit derived from our standardization unless this movement out of our State of inferior fruit is curtailed or regulated.

In the past our industry has worked along lines of improvement most necessary for a particular section. I believe the time has come when we should act not as individuals, States or sections, but as an industry, and that all sections growing apples in our country should work together in solving and progressing their common interests.

I feel that the horticultural societies of Virginia, West Virginia, Pennsylvania and Maryland should work as one in the handling of the problems and situations which affect this area.

Our industry does not dare depend on the hope for better times as a solution for their problems. The situation is so serious that concerted efforts must be made, if our industry is to prosper. I believe we can do much.

PRESIDENT CARPENTER: I would like to introduce at this time Mr. Robert A. Simpson of Vincennes, Indiana. Mr.

Simpson came from a family of fruit growers. I have had the pleasure of knowing him for many years, and he is one of the most outstanding fruit growers in the Middle West. Mr. Simpson.

HOW CAN WE AS FRUIT GROWERS MEET THE PRESENT CONDITIONS OF OUR INDUSTRY?

In studying the subject assigned to me, I find it a big and complicated subject, but one of vital importance to all of us.

What I have to say on this subject will apply especially to Midwestern conditions, as I am more familiar with these. However, they should also hold true in your section; and in general in all well-cared-for orchards. My suggestions will be based on present financial conditions, and on the assumption that the crop of 1932 will be as large as the one of 1931. Hence, the question must be, "How can we, under existing conditions, best cut production costs in our orchards this coming year?"

Because of low fruit prices during this past year most of the orchardists of Indiana, Illinois and Kentucky are quite limited in cash and credit, and are not in a position to consider new equipment or buildings. At the same time we are forced to reduce expenses wherever practical.

There are two ways of reducing unit costs of production. The first is by additional capital investments, such as: more economical equipment and buildings, or permanent soil improvement projects. We are coming to realize that high yields are more closely related to low production costs than any other single factor. I refer here especially to the incorporation of additional humus and fertilizers in the soil, to a central spray plant, modern packing house and equipment, and to a cold-storage plant where really needed. This usually means additional costs. However, there are few so fortunate this year as to be able to invest additional capital, though it certainly is the coming method of expense reduction.

The second method of reducing unit costs of production is by cutting costs without additional expansion. But in cutting expenses we must be extremely careful we do not *actually increase* the final cost per bushel.

I want to spend the most of the time talking to those who must cut expenses in some way for the coming year. In studying this problem I have asked some questions of a number of prominent scientific men and practical growers of the Middle and Eastern States. The remarkable thing is *the great difference of opinion as to which are the most outstanding expenses that may be reduced temporarily or eliminated for the present year.* This difference of opinion is exactly what we might expect, and is what I want to emphasize.

Each man owns his own orchard—orchards located in various States, on various sites and kinds of soil, of different ages, and planted to many varieties. Each man practices different methods of pruning, spraying, fertilizing and cultivation. The trees themselves make different kinds of growth and yield differently. And there are many other differing advantages and disadvantages. In short, each orchard has a different manager, be he good or bad, and a different problem. So you can see how greatly requirements will vary for properly cutting costs this coming year.

For this reason we should all be very careful about making radical changes just because someone else recommends them. Analyze the advice. Be sure your advisor has similar conditions in mind, or thoroughly understands the past history of your orchard, and that his advised method is better than your plan, *under your conditions.* If you are in doubt, take it up with your Government experts or with your Horticultural Extension man.

I do not like to make definite recommendations, therefore, among other things, I submit the following suggestions for your careful consideration, if you must temporarily reduce your costs of production:

I. If you have varieties or blocks in old orchards which have received good care, but have not been profitable for the past five years, cut them out. If you have young trees of an undesirable variety, I would suggest topworking before another year. Remove all very weak and diseased trees, and help those individuals which will profitably respond to help. In other words, make your boarders pay or cut them out.

I believe one of the greatest leaks in our orchard business today is caused, directly or indirectly, by the thousands of acres of non-profitable orchards, and the thousands of individual trees which are low producers.

Here certainly is an important and undeveloped field for our extension men and our horticultural societies. We must create an emergency interest among growers toward locating their blocks, varieties, and, if possible, the individual trees which have been losing them money over a period of years.

In other words, the time is now here when we as growers, for economical reasons, will absolutely *have* to do more practical research in our orchards. For example: We used nitrate of soda on a block of poor Grimes trees. The fertilizer cost $3.00. We made $60 off the crop.

II. Remove all filler trees that need to be removed. Also, if peach trees are planted too close in the older orchards, cut out all the poor trees, or still better, cut out every other row diagonally—especially if fruit is killed this winter.

III. In apple orchards that have been correctly pruned during the past two years, pruning costs may be reduced by simply removing large one-year water sprouts, and diseased and broken limbs. Forget the detail pruning for this year. In peach orchards prune as usual. Also, in apple trees which are too dense and must be pruned, reduce your expenses by half by removing only the most objectionable, medium sized limbs.

IV. Cultivation costs may be reduced by seeding down the apple orchard for a year or more. If cultivation is necessary and the season not too dry, cultivate early, but leave off the later cultivations. Or cultivate early and seed to a cover crop which will make a large quantity of humus. This may be turned under and a second crop sowed the same year. With peaches, if the season is not too dry, cultivate fewer times, but cultivate early.

In Illinois many of the best growers are liming their orchards and are growing yellow sweet clover. They are sure sweet clover is giving decidedly beneficial results. A few have planted this legume with success along ravines and on erosive ground in their peach orchards.

In Kentucky a number of apple orchards are planted to Korean lespedesa, a legume which seems to do very well without lime. Kentucky growers think this crop is going to be of much benefit under their conditions.

A number of orchards around Vincennes, Indiana, have been seeded to vetch or yellow sweet clover with very satisfactory results. Others are using soy beans, followed by rye. Our older orchard, now about twenty-seven years old, has been mulched continuously with wheat straw for over fifteen years. This orchard has been exceptional in heavy yields and regular bearing. Such a mulch conserves moisture, maintains a more even soil temperature, aids bacterial activity, and adds more humus to the soil as it decays. A straw mulch keeps down grass and weeds under the trees, aids the tree in time of drought, and reduces the bruising of fallen fruit to a minimum, as well as keeping it free from mud in wet weather. Picking up, in this case, is an easy matter. One can also think of a number of other advantages from a mulch.

V. If wages are too high, reduce them. However, this may prove a serious mistake if it is likely to result in loss in quality of work or loss of experienced men.

VI. Try some incentive for more efficient, higher quality

and faster work. One method found practical by many growers is paying pickers by the bushel. In this case, where apples were thick, 3 cents to 4 cents was paid per bushel. These pickers often made $3.00 to $4.00 a day. The crop was harvested with one-third less pickers, which meant a big saving in harvesting costs.

Another method found practical was the use of tickets with the pickers, merely for information as to the number of bushels picked, and the location of careless or color-blind pickers. Above all such a system stimulates the best efforts and the interest of the workmen, locates the slow man, and enables you to get more bushels picked per day with less cost per bushel. Considerably less men are required to harvest the same crop.

VII. Leave off nitrogen for one year where your young bearing orchard is on good ground and the trees in good vigor, as indicated by dark foliage and a good stocky terminal growth. Also this may be done where legumes have been growing for several years, or have been turned under; also, where the trees have been growing too fast, or in blocks of older trees where there is an abundance of humus in the soil and vitality is unusually good.

Personally, however, I am opposed to reducing nitrogen applications in orchards where the soil is low or even moderately low in this most necessary plant food.

I also believe there has been too much fertilizer applied indiscriminately. Now is a good time for the intelligent operator to apply fertilizers where they are most needed,— not arbitrarily resolve that the entire orchard should receive a certain number of pounds per tree. In other words, he should study the individual needs of varieties, blocks, and types of soil. If he cares to go further, he may well study the needs of the individual trees. Only then is he ready to apply his fertilizer to best advantage. Do not decrease the amount of fertilizer you had intended to buy,— just be sure it is placed where it will yield the greatest possible returns. Perhaps you cannot treat the individual, but cer-

tainly some blocks and varieties may be missed for one year, and others given an additional amount.

VIII. Spraying costs *may* be reduced, but *only* under a few conditions.

First, in *young* bearing orchards where scab and codling moth are under perfect control, provided weather and temperature are not especially favorable for their development.

Second, in *older* orchards where insects and diseases are thoroughly under control. In this case one or two sprays may be eliminated by more careful timing.

The emergence and development of the codling moth are greatly influenced by such factors as: temperature, elevation, types of soil, and cultural methods. Since the severity of the infection varies from year to year, depending upon temperature at the time of emergence of moths, length of growing season, and degree of infection the previous year, be *extremely* cautious about trying to cut expenses here. You may safely cut the spray bill *only* where you are assured of a *greater* kill at a *lower* cost.

Please let me emphasize this—where scab, codling moth, moth, or scale was at all bad last year, do not even consider reducing last year's schedule. All growers and scientific men answering my recent questionnaire agreed that thorough spraying is *the one* major operation that is absolutely essential, and that *we absolutely must* spray enough to control our insects and diseases.

In conclusion, I feel each grower should realize:

1. After getting all the helpful information possible, each man must work out *his own* local and individual problems for the coming season.

2. That he should ascertain in advance how much money will be available for the production of the coming crop, and carefully cut accordingly. Otherwise, he might go half through the season and suddenly realize that he would not have enough money to finish out the year.

3. That he should review at once his past records, methods, expenses, and results. He should get all information possible from the Department of Agriculture and from his Experiment Station, from literature on the subject, and from other successful growers who have similar conditions.

4. That he should lay his plans for the coming year on as economical but practical basis as possible. He must guard against radical changes and false economy, for it may mean a great loss in the coming harvest and to future crops.

5. That he should reduce wages when necessary, but hold on to good experienced men.

6. Co-operation between growers, where possible, in packing and marketing, and in purchasing of materials and equipment. An example of this is the pooling of orders, enabling him to get lower prices on supplies and equipment. Many are saving money by buying through county and state Fruit Growers' Associations, and by buying and selling through associations or co-operative organizations.

7. That he should, as far as possible, arrange in advance for outlets for all grades of fruit, and plan the most economical methods of harvesting, distribution, and selling.

8. By closer personal supervision, he can cut out many unnecessary expenses, and cork up many of the small leaks, for there are many. By seeing to it that machinery and equipment are in good running order, no time will be lost when these are needed for use. Much money can be saved in controlling the codling moth by orchard sanitation, especially in and around the packing house.

9. Be an optimist, and go to at least one more state horticultural meeting this year, even if you have to hitch-hike, for you will get additional information and meet men who will be of benefit to you. I believe if we sit tight in the boat, use the oars skillfully, and don't go too far from shore,

we can ride this depression into the prosperity which must follow.

PRESIDENT CARPENTER: Mr. Simpson, in this region, among the unprofitable varieties, Grimes Golden seems to be the one most under consideration. We are growing Grimes Golden on a varied character of soils, some good and some bad. Our market outlets are in the south and middle west, and to some extent, for export to Scandinavia. You are growing Grimes Golden under probably as favorable conditions as could be conceived. Do you feel that the Grimes Golden is profitable with you under your soil conditions, and would it be so if difficulty were experienced in securing Grimes Golden of 2½-inch minimum diameter.

MR. SIMPSON: When it comes to the question of variety, I think we are all going to have to study varieties more than we ever have before, and I think that there are certain locations where the Grimes might be very profitable. In our case, it is one of the most profitable varieties we have, with the exception of this year. No one wants Grimes this. year. But the Grimes is a very heavy yielder, and certain markets like it.

We find that Grimes Golden trees should be double worked. We find we can make our orchard last twice as long with double-working trees. Under our conditions the Grimes has been the most profitable orchard variety we have. In the future I would not plan very heavily on it, because the Golden Delicious seems to be coming in faster, and will probably take its place. It is a longer keeper, and is more attractive for special, high-class stands.

I would say that any variety that is not profitable in your locality, and that you cannot make profitable, ought to be eliminated and other varieties planted. If I had a young orchard of Grimes and didn't think it would be proftable, I would top work it to the variety that I thought would be the most profitable in that section.

MR. TOWSON: You spoke about yellow sweet clover. Is that a practice out there?

MR. SIMPSON: I said in a small way, they are planting it in ravines and on pieces of land that are erosive, where the ground is washing away, and in that case, those who have been trying it for four or five years say the trees seem to be growing as well or even a little better than where they were using the clean cultivation. It can be sowed real early, or a little later. Some sow it in February or in January, any time the ground will work.

MR. TOWSON: When do you cultivate?

MR. SIMPSON: You get it in the ground the first season, and the coming year—(it lasts two years), it goes to seed, and then would be cultivated early in the season, but cultivated shallowly, and you would still get a stand the coming year. The sweet clover does have to be limed.

MR. TOWSON: Do you recommend the yellow sweet clover in preference to the white?

MR. SIMPSON: There is this advantage, that it doesn't grow as tall. It seems to have the same effect, and does not grow as rank. It is easy to get over if you are going along with your hose; you can drag it over better. That is one objection to sweet clover; pulling the hose along. A grower in Indiana has been raising sweet clover for eight or ten years, and twice a year he drags it down, dragging it the way that the spray rig will go. His soil is very poor and hard, and clover seems to make a deep root system and unlocks a lot of food and puts a lot of humus in the ground.

MR. LEE ALLEN: Do they mow it at all?

MR. SIMPSON: They sometimes clip it once, just to make it branch out and not be so high.

MR. LEE ALLEN: That is the first year?

MR. SIMPSON: That is the first crop of the second year. The first year it doesn't grow so very high.

DR. MAGNESS: Has the fire hazard been serious under these conditions?

MR. SIMPSON: I understand that is one thing they have to be careful about. It is very natural that they should. If a fire went over a thing like that, it would be very disastrous. In the case of most of our apple trees, we did some cultivating between the mulch, dragged through the middle each way, and followed up with manure at times.

MR. WALKER: You spoke of using lime. Is there any objection in apple or peach orchards?

MR. SIMPSON: None that I know of, and I don't know of any advantage outside of getting the ground in good physical condition for growing legumes. I have never heard of any objection, nor of any benefit directly from it, but indirectly there is a great benefit.

MR. E. D. MCCAIN: Have you had any trouble with collar rot on your Grimes, and if so, have you succeeded in saving any of your trees, or a percentage of your trees that have been affected?

MR. SIMPSON: Yes. About twenty-eight years ago we planted an orchard and top-worked or double-worked that, and have prevented that collar rot. We planted Northern Spy and cut off the mother root, which left a true Northern Spy root, then we top-worked to Grimes. Our Grimes are twenty-eight years old and are going fine, whereas, the fillers, which were not top-worked, have all died out. I think it is very practical to double-work Grimes. I wouldn't plant a Grimes otherwise. Dr. Cullinan found in Indiana, that the Virginia Crab is a wonderful stock to work the Grimes on, really better than Northern Spy, but the Northern Spy really has done wonderful work for us. I am sure it will double the life of the tree, which means a lot.

MR. LEE ALLEN: On some of these very light types of soils where you have difficulty getting organic matter where the cover crop was mostly rye, sometimes vetch, would you consider it advisable under any conditions to let that rye grow in spring until it got a foot and a half or two feet high in order to get a greater quantity of organic matter?

MR. SIMPSON: I think it would be a desirable thing to let it grow, but I would chop it under when it got to be a foot and a half high. I wouldn't let it get to the point where it was going to head out. I don't believe I would go that far. Sometimes you have to, though, for instance, in case of rain. It did that last year and we couldn't get it under until it began to head out, but we didn't see any injurious effect from it under our circumstances. We have one block which is beginning to wash pretty badly, and this year we are going to sow some sweet clover in that block, and I think it will hold the soil, and I believe it is going to help out in other ways.

MR. HAWKINS: You say you put three dollars worth of nitrogen on and got sixty dollars worth of benefit from it? Did you ever try it on peaches?

MR. SIMPSON: We use it on everything now. We have seen some very marked results from the lack of nitrogen. That is the reason I say it is good to do it on your own orchard because your soil may be different from the fellow's across the way.

MR. HAWKINS: How much do you use on peaches?

MR. SIMPSON: Under our conditions we never use more than three pounds. We usually make two applications of nitrate of soda, one before they bloom and one some time afterwards, depending on variety and set of buds. We put it on about the first of June, because we think it helps the growth right at the time the bacterium pruni bothers us. We think it is a decided advantage, especially on the weaker varieties.

MR. HAWKINS: Do you lose anything on color where you apply it?

MR. SIMPSON: I don't think so, unless you put on too much. In our section four pounds will not make any special difference if trees are properly pruned.

MR. HAWKINS: Do you distribute it over the whole surface?

MR. SIMPSON: We spread about three feet from the spread of the limbs. We think we get more benefit that way than if we spread it over the whole ground.

MR. SEVY: When you put your cover crop under, do you plow or disc?

MR. SIMPSON: It is all right to plow, but the peach roots are so close to the top we don't like to disturb the roots. Therefore, we have practiced discing almost altogether in our orchard, especially in peaches.

MR. AARON NEWCOMER: Suphate of ammonia is considerably cheaper in our section than nitrate of soda. Have you ever had any experience with it?

MR. SIMPSON: Yes, we have used a lot of it. There is much difference of opinion as to which is the better. Sulphate of ammonia does make the ground a little bit more sour than the other, and later you will have to add a little more lime. It seems to me that the nitrate of soda has some little advantage, especially on some soils. Just what the difference is, I don't know.

MR. ENGLAR: Did you have any leaf hoppers this year?

MR. SIMPSON: Yes, we have had them for a good many years, but in our section they do not bother us very much. They do bother more on the Grimes Golden, I believe than any other variety. They bother on Jonathan, too.

MR. ENGLAR: We had serious difficulty with them all

through the season. It didn't seem to matter what you put on them, they thrived.

MR. SIMPSON: I would suggest you get an entomologist to tell you about that.

MR. HEPLER: There is quite a bit of bacterium pruni about the orchards in Vincennes. I want to know your experience with zinc sulphate in controlling pruni.

MR. SIMPSON: It gives very satisfactory results. It is in general practice in most of the orchards. We find, for instance, Hale is more subject to bacterium pruni than Elberta, and many are using that just on the Hale and on poor blocks or poor orchards. It seems that the poorer the ground and the lower in vitality, the more trouble we have with the bacterium pruni.

MR. HEPLER: Do you get control of brown rot with the same fungicide?

MR. SIMPSON: Since that has come into use we have not had any brown rot in our section, so I can't answer that question. Zinc sulphate was gotten up in Vincennes, by Mr. Pierce, in the Government laboratory.

MR. ALBERT ALLEN: Speaking of peaches, have you ever used any summer cover crops, soy beans, corn, cow peas, and if so, did you find any combination, and what time did you turn those under?

MR. SIMPSON: We have usually planted rye in the fall, and then in the spring disced it under and then sowed cow peas or soy beans in the younger orchards, and when we turned those peas under, we could usually turn them under before the seed began to get hard. We thought we had better results doing it that way, and the same with soy beans.

MR. ALBERT ALLEN: You didn't use it in the bearing orchards?

MR. SIMPSON: Yes, but only in the younger orchards

where we had plenty of room. In these older orchards it is pretty hard to get results, especially if you have a crop on. You can sow soy beans after you have taken the crop off, but you will not get a large growth. I think in the younger orchards we can turn more of those things under, and I think we should.

PRESIDENT CARPENTER: If there are no further questions, I will call upon Dr. Auchter, to discuss the subject, "With the Low Commodity Prices Prevailing, What Orchard Management Policy Should We Follow?" Dr. Auchter.

WITH LOW PRICES PREVAILING, WHAT ORCHARD MANAGEMENT POLICY SHOULD WE FOLLOW THIS YEAR?

By DR. E. C. AUCHTER, Principal Horticulturist,
United States Department of Agriculture.

Mr. President and Friends: From the title of the paper assigned to me by your Secretary I imagine that it infers that some of you are anxious to know how far you can cut corners and reduce expenses this year without seriously hurting the orchard and crop.

If it will console you any, I can honestly say that the growers in practically every other section of the country are asking these same questions. This is not much consolation, but it sometimes helps to know that others are in the same boat with us when we are attempting to navigate a new and somewhat unknown stream.

I believe we have gradually come to realize in most sections that the main way to reduce cost of production and make more net profit is to

First, eliminate the poor or marginal orchards.

Second, increase the yield per tree of high quality (good size and color) fruit.

Third, to harvest and pack the fruit in the most economical way.

Fourth, to have sufficient storage facilities (either common or cold, as the case may be) to withhold part of the fruit from the market so that a better distribution of the fruit over a longer period will be made, which will tend to prevent gluts and result in a better price.

This means:

In the *first* case, to use the axe and tractor.

In the *second* case, to use the best methods of orchard management known in order to increase the growth of the tree so that annual crops as nearly as possible, of high quality fruit will be produced.

In the *third* and *fourth* cases, to make additional capital investments for proper spraying machines or plants, proper cultural equipment, modern packing houses and common or cold storage facilities.

However, many of these recommendations, such as additional capital investments and increased operating costs per tree or acre cannot and probably should not be followed by many orchardists during the coming year, though they should be kept in mind as desirable as soon as economic conditions will permit.

The question, then, which confronts us under the present existing economic conditions is how best to cut operating orchard management expenses for the next year with the least harm to our orchards and still approach satisfactory yields of good fruit. As previously outlined this is a difficult subject to discuss because generally speaking each individual orchard presents a different problem and probably should be handled differently. Likewise, I imagine the financial condition of different growers is different and some growers may be in position to continue with the best

orchard practices during the coming year. In such cases, I feel that those growers should be very careful about attempting to radically change or decrease what appears to be sound orchard practice. In attempting to cut or reduce expenses we must be very careful that we do not actually increase the final cost per bushel through decreased yields of poor quality fruit.

However, there are many growers in several states who must cut some or all of their expenses during the coming year if they are to operate their orchards at all. It is the problems of such growers that I wish to discuss briefly and suggest some ways in which costs may be reduced without too serious or permanent consequences.

Tree Removal.

A. If through changed conditions of transportation, storage facilities and heavier plantings in other regions, certain varieties have consistently been unprofitable for several years and especially if the trees are old, cut them out.

B. If you have young trees of what now promises to be an undesirable variety, either cut them out or top work them at once.

C. Remove all very weak, consistently light bearing or diseased trees. Thus make your boarders pay or cut them out.

D. We know that the relative profitableness of certain varieties has changed in recent years and that we have many individual trees in our orchards which are not paying their way. This is the time to stop talking and start acting in getting rid of them.

E. Remove at once, especially on the light soil types, all filler trees which need to be removed so that the permanent trees will receive more moisture and soil nutrients in the hope that their crops will be larger and of higher quality without the additional expense of fertilization, cultivation, etc., of the filler trees. In orchards planted so close that

crowding is evident, at least cut out each alternate diagonal row leaving one-half as many trees or four on the square with one in the middle.

If you have too much acreage to care for properly, reduce it and grow properly and to its full capacity the remaining acreage. I mean by this that if a grower does not and cannot buy enough equipment and if he does not have sufficient capital to hire enough labor to properly take care of his total acreage, it will probably be better to reduce the acreage and spend the same amount of effort and money on the reduced acreage. The yield per tree and acre of high quality fruit will probably be increased and the total net returns larger.

Pollination.

If orchards of one variety are planted in relatively large blocks, bring in blossoming branches of other varieties at blossoming time and place in tubs of water in order to insure satisfactory "sets" of fruit. Plan to top work or replant certain trees to handle this permanently.

Fertilization.

A. If orchards are on fairly good soils, have been given moderate to liberal applications of nitrogen during the past four or five years and in addition if organic matter has been added yearly through cover crops, sod mulch or additional mulch so that the trees are vigorous as indicated by a good growth of spurs, trunks and terminals and color of foliage, it would seem that the amount of nitrogen to be applied under such conditions could be greatly reduced if not entirely eliminated for one year without serious consequence. This would be especially true with young orchards just coming into bearing or with older bearing orchards which seem unusually vigorous.

B. With orchards on lighter soils which have not been given especially good soil management treatments or sufficient nitrogen in the past, at least one-half or possibly two-

thirds of the usual amount of nitrogen should be added unless a very light crop was expected. In such a case, at least one-fourth of the usual amounts should be applied unless unusually good cultivation and pruning practices were to be followed.

C. Make a study of young individual orchards. Possibly the application of nitrogen can be omitted or greatly reduced on certain varieties or blocks of trees while other varieties and blocks should receive the normal amount. This would be a good year to give more attention to the individual trees and not issue a blanket order for fertilization. Have your men "use their head" and reduce the amount per tree on the younger, replanted, or very vigorous individuals in the orchard and apply a little more to certain ones which appear to need it. In this way, the same amount of fertilizer used per orchard will be applied more intelligently and probably a more efficient use of it will be made.

D. We have some experimental evidence to show that trees do gradually build up a nitrogen reserve and that trees which have been fertilized well for a few years will continue to grow better for a year or two after applications of nitrogen are stopped than similar trees which have not previously been fertilized.

Soil Management.

A. Those growers who practice a system of clean cultivation and cover crops in the orchard and who have been cultivating or discing six to eight times should plan to reduce the number of cultivations this year.

Preliminary experiments in some states indicate that if the orchard is plowed or disced early or at about the time the terminal buds are opening and if two or three additional early discings are given the trees will grow very satisfactorily, have healthy foliage and produce good crops. In fact, fewer early cultivations seem to produce as desirable results as many more cultivations made later in the season.

Nitrification appears to proceed earlier and faster in the spring where the soil is cultivated. Loss of moisture by the growing cover crop is also prevented. We all recall that fruit spur growth is made very early in the season (two to three weeks after blossoming) and that terminal growth is completed about the first of July in most seasons. The need, then, for earlier cultivation is apparent and the cost per acre for the season can be reduced by the elimination of part of the cultivation if the work is done early.

B. A fairly good and uniform growth of volunteer weeds, or grass will occur in some orchards when cultivation is stopped. It would seem unwise under such conditions to spend money for cover crop seed. The important thing is to get organic matter into the soil from the standpoint of improving its moisture holding capacity and general physical condition.

C. It would seem safe to omit the expense of buying seed, preparing the ground and sowing the cover crop *for one year* in those orchards in which the soil has a fairly high organic matter content. But it seems questionable if cover crops should be omitted on the relatively light soils where moisture is more liable to be the limiting factor. Use the cover crop which will give the greater amount of organic matter at the cheapest cost.

D. Under many conditions, as for instance, steep, stony or rough ground, it will no doubt be wise to seed the orchard down and reduce soil erosion and cultivation costs. Under more level and fertile conditions cultivation costs could be reduced at least temporarily by seeding down the orchard for a year or two but under such conditions it must be remembered that much more nitrogen per tree must be added if growth and production are to be maintained.

E. If a cheap supply of mulching material such as straw or cornstalks is available so that the ground can be well covered, this would probably be the cheapest and most satisfactory method of management to use as long as the cheap

source of material is available. Experiments in several states show that moisture is well conserved by such a mulch and that if nitrogen is added to the trees, good results follow. Danger from both mice and fire is serious, however, under such conditions and care must be taken to prevent injury from these sources.

Pruning.

A. Young non-bearing trees need relatively little pruning, just enough to form a good head and balance up the tree. Experiments have shown that such trees with more buds and leaves, grow faster, come into bearing earlier and produce larger crops.

B. Young bearing trees likewise need little pruning and costs could be reduced this year by doing only a little thinning out in such trees.

C. Older bearing trees normally respond better to a heavier pruning, consisting mainly of the removal of several small twigs and branches scattered uniformly over the tree. By such pruning, spur and terminal growth is usually stimulated, the set of fruit and new buds is increased and sunlight can better enter all parts of the tree.

D. In these older orchards especially if they are on good soils and if such pruning has been practiced for the past four or five years, it would seem that pruning costs could be decreased this year by omitting such detailed pruning. Water sprouts should be cut out; dead, diseased and broken limbs removed and only an occasional limb cut in the tops of the trees to allow more sunlight to enter. This should greatly reduce the cost of pruning.

E. The amount of pruning of old bearing orchards on relatively light or poor soils should not be greatly reduced, however, unless proper soil management and fertilization are given.

Thinning.

A. Wait until after the June drop is well over before starting your thinning operations and then spend most of your energies and money allotted for thinning on those varieties which normally show the greatest benefit from thinning.

B. Do not attempt to thin to any uniform thinning distance as for instance, 6, 8 or 10 inches apart but thin the individual trees and limbs on the tree depending upon their crop. Recent experimental evidence indicates that from 30 to 40 leaves per apple are necessary for the production of fruit of good size and color. Recent evidence also indicated that the elaborated materials formed by the leaves will benefit apples at quite some distance away. This shows that fruit need not be heavily thinned on certain limbs if other limbs have light crops or that all clusters at least in the case of many varieties need not be separated if the crop is otherwise light on the limb and tree.

General Considerations.

So far I have been discussing ways to reduce the cost of the main production operations, but it should be clearly evident to all that it would be disastrous to reduce all of these operations the same year. This would be especially true in this section which has suffered from drought during the past two years. If less cultivation, less pruning, less fertilization and less thinning are all given, a high percentage of fruit of good size and good color cannot be expected. These practices, properly performed all contribute to the production of excellent fruit. How much you should reduce or cut out any practice will depend on how much you plan to reduce the others. For instance, if you change your soil management practice, so that less water and nitrates will be available to each fruit, then competition between fruit must be reduced through pruning or thinning. Likewise if pruning and thinning are eliminated this year then good soil management and fertilization

must be given. Of course, the amount that any or all of these practices can be reduced will vary with the soil conditions and vigor of the individual orchards. Don't do what your neighbor does necessarily. Diagnose your own case and if in doubt consult with your county agent and extension, college and station specialists. Remember these statements of mine are only general suggestions based in part on experimental evidence and in part on general observations. If the good growth conditions now prevailing in some orchards and especially with certain varieties have resulted or aided in securing annual crops, it would be highly undesirable to reduce all orchard practices to such an extent that growth would be seriously checked and the orchard become biennial in bearing.

Spraying.

I hardly see where much reduction in the spraying cost can be eliminated. Leaves and fruit must be kept free from attacks of insects and fungous diseases. Blemished fruit does not pay for its cost of production.

Instill interest and pride in your working staff.

A. By this means, fruit will be handled more carefully. Big losses occur from rough handling during picking and grading and later in storage.

B. Use picking tickets to check the workers.

C. Piece work or paying a certain price per bushel for picking instead of a flat price per day should speed up harvesting and reduce the harvesting costs.

Packing.

This must be kept on a high standard. The only way to reduce this cost is through better packing house organization and management.

Equipment.

It would seem desirable that growers should attempt to

get along for the coming year with such equipment as they now have unless such equipment is entirely worn out.

In summary, I would say that poor varieties, poor blocks and poor individuals should be eliminated. After this is done we must remember that quality fruit is demanded. Some of the factors that influence orchard sales to the consumer are, (1) quality, (2) color, (3) uniform size, (4) price, (5) freedom from bruises, (6) variety and (7) freedom from disease and insect injury. We must, therefore, have good, clean, well-colored fruit. We know that we need a high yield per acre in order to reduce the cost per bushel. You must, therefore, study your own conditions and determine how far you should go in reducing your soil management, pruning, fertilization and thinning practices and still secure good crops of high quality fruit. Surely the fruit which is produced must be well sprayed, carefully handled, properly packed in the most desirable packages, advertised well and merchandized properly if you are to compete with other regions in this and other countries.

Adjournment.

TUESDAY AFTERNOON

January 5, 1932

The Second Session convened at one forty-five o'clock, President Carpenter presiding.

PRESIDENT CARPENTER: The meeting will come to order. Our first speaker is Dr. J. H. Beaumont, head of the Department of Horticulture, North Carolina College of Agriculture, Raleigh, North Carolina. Dr. Beaumont.

IMPROVING THE SIZE AND QUALITY OF OUR PEACHES

By DR. J. H. BEAUMONT, Head Department of Horticulture, North Carolina Agricultural Experiment Station.

In general we know the facts in regard to the growing and marketing of peaches. We know that the margin of profit is the difference between the cost of production or other fixed charges and the price received for our crop. Costs of production vary with the region, the soil and the management while prices vary with the volume and grade of peaches on the market. The volume on the market is largely a matter of total yield, distribution and storage and is largely beyond the individual grower's control. The grade, however is within his control and given peaches free from worms, blemishes and in a proper stage of maturity the most important factors determining grade are *size* and *color*. This is certainly true under the conditions that Georgia and North Carolina peaches are marketed and partiticularly so during seasons of heavy production. I will quote from U. S. D. A. Technical Bulletin 115.*

"Thus during the period of 1924, when peaches of a size to pack 2-1-6 were bringing the Georgia grower a net return of about 80c per crate, or about 25c above harvesting costs;

*Kantor, Harry S. Factors affecting the price of peaches in the New York City market. U. S. D. A. Tech. Bul. 115. 1929.

2-2-6 peaches were returning only about 55c or just enough to cover harvesting costs (costs of growing were a loss), and 2-3-6 peaches were returning only about 20c, a loss to the grower of over 30c on harvesting alone."

Thus it is easily seen that under conditions of heavy production and supply it becomes a liability to have, and to attempt, to market small-sized and low-grade fruit. Therefore, so far as the individual peach grower is concerned the price received is intimately related to the size, color and quality of the peach he puts on the market. Opposed to this are the various factors involved in producing large size, high quality peaches which must not reduce the yield nor increase the costs excessively. If this is a fair statement of the situation, then it is only good business to study our orchard practices from the standpoint of producing as large a volume of the best grades as economically as possible. As we will show, size, color and quality are intimately associated with orchard practices.

In order to understand the factors of importance affecting the development of size in peaches, let us consider first how a peach fruit develops. A number of investigators have observed that the stone fruits have three well defined periods of growth. The first period of rapid development lasts for approximately 6 weeks after bloom, during which the stone develops in the flesh to practically full size and then begins to harden. The second period of approximately 6 weeks is one of very slow growth of the flesh and the hardening of the stone. The third stage of growth (final "swell") is characterized by a great increase in the volume of the flesh, continuing to maturity. In Maryland and New Jersey this period begins about August 1 for Elberta.

At the college orchard of the Maryland Experiment Station, Weinberger found that Elberta peaches began to grow very rapidly after August 2, increasing in volume 0.7 c.c. per day, in spite of the fact that it was during the hottest and dryest part of the summer. The soil was powdery, the weeds dried up and the peach leaves wilted. The leaf stomata or pores, remained open less than three hours per

day. On August 2 then, the peaches started to grow much faster than they had grown before. On August 9, rain fell and after that, abundance of moisture was available. The peaches grew 25 c.c. in volume per day until sharvest. Therefore, the third period of growth will begin in spite of weather conditions.

What would have happened had it stayed dry? Two experiments answer this question. Hendrickson and Viehmeyer, in California, studied the growth and quality of Tuscan and Phillips Cling peaches under dry and irrigated conditions. Both plots received the same treatment until 8 weeks before harvest when irrigation was stopped on the dry plot. On July 29 the soil moisture in the 1 to 4 feet levels of the dry plot was near or below the wilting percentage. The third period of growth began July 15, and continued until September 1. On July the volume or size of peaches on the two plots was the same (12 c.c.). At harvest the volume of the fruit was 30 c.c. and 50 c.c. for the dry and irrigated plots respectively, or 20 c.c. in volume difference between the two treatments.

In North Carolina we established three soil moisture plots in a block of Georgia Belle trees. We created dry conditions by completely covering the ground with mulch paper to prevent rain from wetting the soil. An irrigated plot was given two irrigations when the moisture content of the soil indicated it was needed. A third plot was taken to represent average moisture conditions. The trees in these three blocks were thinned uniformly. The trees on the dry plot produced peaches averaging 50 c.c. in volume, those on the average or check plot 84 c.c.; and the trees on the irrigated plot 105 c.c. in volume. These differences are very striking, particularly those for irrigation. The irrigations were made before the swell began and produced an immediate effect on the behavior of the stomates or pores in the leaves, while the average or check plot had only slightly better moisture conditions than the dry plot. The effect of the additional moisture lasted only about 2 weeks, for, at the end of this time rains fell which brought

the soil moisture of the check and irrigated plots to approximately the same level. Thus the 20 c.c. difference in volume can largely be referred to a two weeks' period during which the soil moisture was insufficient for growth of the trees and fruit on the check plot. These results as well as those of Hendrickson and Viehmeyer demonstrate conclusively the value of soil moisture in sizing the fruit.

Another factor affecting the size, color and quality of the fruit is the effective leaf area per fruit. Leaf area has been talked of a great deal particularly in relation to the growth of apples. More recently a number of investigators have turned their attention to peaches. Does leaf area have any effect on size of peaches, and if so, how much? Weinberger, in 1931 at the Maryland Experiment Station orchard, thinned peaches and leaves on ringed branches of Elberta and Late Crawford in such a way that 5, 10, 20, 30, 40, 50, and 75 leaves were left per peach. In this experiment we may consider that soil moisture and all other conditions were uniform for all treatments except the number of leaves per fruit. His results were as follows:

No. leaves per fruit	ELBERTA *Initial size 27 c.c. Final Attained size (c.c.)	LATE CRAWFORD *Initial size 19 c.c. Final Attained size (c.c.)
5	69	42
10	96	48
20	117	117
30	119	115
40	138	128
50	148	125
75	162	134

*Size of fruit at beginning of experiment.

Note first that as the number of leaves per fruit is increased the size of fruit likewise is increased. However, the increase in size is not proportional to the number of leaves. That is, if a peach tree has leaves and fruit in the

proportion 5 leaves to 1 fruit, removing half the fruit and doubling the ratio of leaves to 10 leaves to 1 fruit does not make the fruit attain twice the size. This may be illustrated in another way. By using these data and assuming that the tree has 1,000 fruits and 5,000 leaves, the yield without thinning would be approximately 2 bushels and the size 1½ inches. By thinning half the fruit the yield would be approximately 1½ bushels and the size 1¾ inches. By thinning three-fourths of the peaches the yield would be approximately ¾ bushels and the size nearly 2 inches. Thus as the yield goes down the size goes up as has been emphasized in so many thinning experiments. It is easily seen that considerable care must be exercised in thinning or the volume and net returns of the crop will be reduced out of proportion to the increased size and value of the fruit obtained.

However, although the size of fruit is not doubled, the leaves continue to function and presumably a larger proportion of the food material manufactured would be used in the formation of fruit buds and the growth of the roots, trunk and branches. Weinberger states that under the soil and climatic conditions existing last year, at College Park, 30 to 40 leaves per fruit was a satisfactory ratio when the future performance of the tree as well as size and quality of the fruit are considered. We may conclude from this statement, and from his data, that if we have a tree with too many fruits in proportion to its leaf area, the fruit will have the first call on the moisture and food supply of the tree. Growth, fruit bud formation and reserves for future crops will be sacrificed. Almost any grower has seen that a tree bearing an unusually heavy crop will usually produce small fruit and weak fruit buds. This was the general condition during the past year, in our section, except where judicious thinning and fertilization were practiced.

The most desirable leaf fruit ratio may be expected to vary with the moisture conditions of different seasons. This may be illustrated from the data secured in North

Carolina on the three soil moisture plots previously described. On these trees, the fruit and leaves were thinned to definite ratios. Here are our results.

Relation of Soil Moisture and Leaf Area to Size of Georgia Belle Peaches
1931

No. leaves per fruit	Dry Plot		Ave. Soil Moisture Plot		Irrigated Plot	
	Size of Fruit July 3	Size of Fruit at Harvest	Size of Fruit July 3	Size of Fruit at Harvest	Size of Fruit July 3	Size of Fruit at Harvest*
15	29	64	31	94	37	104
30	....	....	36	119	42	142
45	33	86	40	138	45	139
60	....	....	42	133	52	141
90	37	100	40	138	....	....

*Harvest—When fruits are picking ripe about August 1.

Note first, that 90 leaves per fruit under extreme drought conditions are only slightly more efficient in affecting size of fruit than 15 leaves on the average soil moisture plot, and not as efficient as 15 leaves on the irrigated plot. Note further that 30 leaves on irrigated trees are more efficient in affecting size than double this number under the average conditions of the orchard. These results show conclusively that the soil moisture directly affects the efficiency of the leaves and consequently the size of the fruit. They emphasize the fact that thinning, pruning and cultural practices must vary, first, with the natural fertility of the soil and second, with seasonal conditions, particularly moisture supply.

That the leaf ratios and the moisture conditions were of considerable importance even before the final "swell" began, is shown by the sizes of the green fruit on July 3. Those on the dry plot had developed least, followed by those on the "average" and irrigated plots respectively. On each plot, likewise, the size of fruit was greater with more leaf area per fruit. These differences while small are reflected in the sizes obtained at harvest.

Here again we see that doubling the number of leaves per fruit does not double the size of the fruit. The practical application, therefore, is that it is possible to increase the size, color, and quality of the fruit by thinning and that in most cases thinning will reduce the total volume of fruit. We have, however, the further observation that thinning must be considered in relation to soil moisture, fertilization, and climatic conditions as well as to the future performance of the tree. If I were in North Carolina, I could be quite specific on this point, that is, that the crop on the tree must be adjusted to the ability of the tree to pay to carry that crop. This means that the crop load and the size of the tree itself must be limited, by pruning and thinning, to the average soil fertility and moisture conditions existing for that particular tree. We stress this point in North Carolina because we are quite certain that a weak tree—one weakened by over-production, defoliation, root rot, etc.—is the next thing to a dead tree.

Soil moisture and defoliation also affect color and quality of fruit. We found that fruits grown on the irrigated plot were far superior to those grown on the "average" (check) and the dry plots. The flavor was good with no trace of bitterness. The color was normal for Georgia Belle, though the color on the dry plot, while extremely high, had a bronzed tint not normal for the variety. The higher leaf to fruit ratios gave fruit of the best quality while the lower ratios gave fruits of insipid, bitter flavor.

CONCLUSIONS

Weinberger said that 30 or 40 leaves per fruit would give a good, large-sized peach that will pack 2-1 and leave a surplus for tree growth and fruit bud formation. This means first that we must thin the peaches to about this proportion of leaves. We must thin to the point where there will be a surplus of carbohydrates for tree growth over that required to size up the fruit. The soil moisture and nitrogen available and the seasonal variations in these

elements will determine the amount of thinning that should be done. In a dry season it may mean pulling off even more fruit, while in a moist or normal season, somewhat less. Experiments have not been conducted to show the exact distances that 30-40 leaves per fruit will give. Six inches for late varieties and 8 to 10 inches for the earlier varieties has, however, given good results.

Thinning is the operation designed to adjust the volume of the fruit on the tree, to the leaf area and moisture conditions of the tree. Pruning also affects these relationships. In North Carolina there seems to be considerable justification for the relatively heavy heading back and thinning-out practiced in that region, particularly on old trees. This type of pruning considerably reduces the crop load and increases the leaf area per peach. Also, it inhibits the development of a large tree which probably would be undesirable under the soil fertility and moisture conditions of the region. The soil and climate, judging by our studies and observations, are not conducive to the growing of heavy crops on large trees. We, therefore, do not feel that pruning, as done at present should be modified a great deal, especially considering the importance of a size and quality, until a soil management and fertilization program can be worked out which will materially improve the moisture and fertility conditions of our soil. Pruning is a means of thinning the fruit, but it is primarily the means of adjusting the tree to the moisture and fertility of the soil to insure continued cropping.

Thirty to forty leaves per fruit. What does this mean? It means thirty dark green, one hundred per cent efficient leaves. What is the good to thin carefully to thirty leaves, which Weinberger says will give the maximum volume and good tree growth if the next day half are burned with arsenic or careless handling of the rods.

Nitrogen directly affects the growth of shoots and the number, size, and vigor of leaves. Nitrogen also affects the moisture requirements of the tree.

The leaves are the work-house of the plant. Their working hours are determined largely by soil moisture. The leaves cannot do their work without adequate moisture, for the leaf stomata (pores) will close during the day if sufficient moisture from the soil is not carried to the leaves. Thus soil moisture, to a certain extent, regulates photosynthesis which is necessary if the fruit and the tree are to grow. How control soil moisture? Irrigation has given results. But most of us cannot irrigate, and the only way left is to improve the moisture-holding capacity of the soil. This, apparently is best done with organic matter. We have relatively little information as to the value of organic matter, from different sources, in relation to its effect on moisture holding capacity of the soil. The big question seems to be the amount necessary. Get as much as possible as cheaply as possible. The kind of material to use will depend upon the crop that you can grow best, no matter whether it is sudan grass, sorghum, buckwheat, rye, clover, vetch, etc. In North Carolina we dug in ten pounds of straw in twenty-five square feet of soil in a peach orchard and observed the moisture percent of this plot during the past season. We found that straw at the rate of a ton to the acre increased the moisture-holding capacity of the soil two to three percent which is an increase of between thirty to sixty tons of water per acre thruout the season. Organic matter, therefore, is about the only way the peach grower can influence the moisture available to the tree so as to develop size, color, and quality of fruit. There are certain limitations to the possibility of controlling moisture supply by this means, but these are mainly due to seasonal conditions. In such a season as 1930, for example, even the trees on the best soils suffered because of lack of water. Generally, however, trees on the good soils suffered less than those on poor soils.

Another way to adjust soil moisture to the requirements of the tree is to adjust the tree. On the coarse sands of North Carolina, it is extremely difficult to build up the organic matter content, for a number of reasons. We,

therefore, are limited by the soil conditions to certain limits of tree size and production. In order to obtain size and quality we must limit the size of the tree and volume of the crop to the limits imposed by the soil. As soil fertility is improved in the orchard larger trees may be grown.

Thus we see that while we started out to show that leaf area and soil moisture are directly related to the development of size, color, and quality of peaches we wind up by saying that each and every one of our orchard operations from soil management to pruning through fertilization, spraying and thinning are related to the general problem.

Our tree must be kept in adjustment with the soil and the crop must be regulated to the capacity of the tree. The tree must be fed and the leaves protected from disease and spray-burn. Neglect of any one of these will upset the delicate mechanism and efficiency of the tree. On the other hand, over a period of years, judicious soil management, fertilization, and cover-cropping, designed to improve the fertility and moisture-holding capacity of the soil will enable us to modify our pruning and thinning and gradually increase the yield, size, color, and quality of fruit.

MR. WALKER: What is the best time to thin the tree?

DR. BEAUMONT: We have relatively little or no experimental evidence to show on that point. It seems reasonable, however, that those young peaches do require a certain amount of carbohydrates for their growth and development. They take phosphorous, potash, nitrogen from the soil and develop that into kernel. It seems reasonable therefore, that as early thinning as possible would be better, although I think that under certain conditions, that is, drought conditions, this thinning can be done rather late, and we do have some experiments to show that under special conditions perhaps we might delay our thinning, to as late as a month or six weeks before harvesting.

MR. WALKER: In the period before final growth?

DR. BEAUMONT: Yes, before the swell begins.

MR. WALKER: What is the average cost of thinning per tree?

DR. BEAUMONT: I couldn't tell you exactly, but I do know the cost in one or two particular orchards in North Carolina. This particular grower thins rather consistently and rather well. He thins as soon after the crop is set as he can. Later, before harvesting, he goes through and thins the cull peaches, those that have spray burn and bacterial spot and visible worm injury, etc. He pulls a large part of those off, and from that standpoint it seems to me that that thinning may logically be called part of the harvesting cost rather than really thinning. But to answer your question specifically, that is going to vary, I think, with the size of the tree, size of the crop, etc., and it is rather difficult to give a specific figure. This grower has spent six cents a tree.

MR. TOWSON: You mean pulling them off with the fingers?

DR. BEAUMONT: Yes.

MR. WALKER: What was the cost of that labor per hour, figuring it cost six cents a tree?

DR. BEAUMONT: Our labor costs perhaps aren't as great as some here. I think the average labor cost runs around twenty cents, or somewhat less. This last year it was less than that.

MR. WALKER: What will the tree produce after being thinned?

DR. BEAUMONT: The average sized tree down there will produce between three and four bushels, and that means about two and a half bushels will be packed.

PRESIDENT CARPENTER: If there are no further questions, our next subjects is "Phony Peach—A New and Dangerous Peach Disease." Dr. Lee M. Hutchins, Pathologist, U. S. Peach Disease Laboratory, Fort Valley, Georgia, will dis-

cuss this subject. This disease is a virus disease, and has been in Georgia and Alabama for several years and each year we are experiencing a spread to new territory. This past year Arkansas was found to have a rather heavy infection and evidence of the spread of the disease as far north as Illinois was recorded this year. We feel it important that our growers be thoroughly familiar with it because of its very devastating nature. Dr. Hutchins.

DR. LEE M. HUTCHINS: In the neighborhood of fifty years ago at Fort Valley, Georgia, there was a family of prominent nurserymen, and they were beginning a great peach industry. They noticed in their orchards a few dwarfed trees. Otherwise they appeared to be perfectly healthy trees, with even greener foliage than other trees. They didn't attach any particular importance to it for the moment. A few years went by, and finally the trees became a little more numerous in their orchards, and as time went along it spread to nearby territories.

As near as we can find out, along about 1900 it was still very rare at Fort Valley, a distance of nine miles away, and by 1915 it was just beginning to be prominent enough so attention was called to it. By 1921 investigations were begun in earnest, and we established a laboratory at Fort Valley. In fifteen or twenty years the disease had become somewhat established at Fort Valley and other places, and by the time we went there we knew it was abundant in central Georgia, in some orchards being exceedingly serious.

A survey was made with very limited man power, and it was impossible to know just how prevalent it might be in distant states, although during those years frequent trips were made to the peach sections of other states without finding phony disease. That was the situation in 1928.

At this time we became very certain as to the classification into which the phony disease falls, namely, the peach yellows, and we proved it was contagious, attributing it to a virus.

The government provided funds for a well organized and

very extensive eradication campaign with headquarters at our laboratory at Fort Valley under Dr. Calmer, Mr. William F. Turner being in charge of eradication at Fort Valley. Not every county has been known to have phony trees, but a great many counties, almost all of the fruit producing district of Georgia has them, and many in Alabama. So you see that from that first little local colony we had at Fort Valley it spread until all of Georgia was involved in 1928, part of Alabama, and now more extensive surveys show it is exceedingly prevalent over this area, and even one outpost in Illinois, the only case we have north of the Ohio River up to the present time. That will give you an idea of our present knowledge as to the distribution, and it is known at no other point in the world, a most interesting fact.

We have four virus diseases of the peach, peach yellows, little peach, peach rosette, and the phony peach disease which appeared on a tree introduced from Europe. None of the diseases are known in Europe; still, they all appear on the plant in America. None of us know where the disease came from.

Perhaps as fruit growers, you would be a little more interested in the character of the disease so you can be on your guard to recognize it in your own orchards. I will show you a few pictures of the disease. These pictures will serve to show you the characters of the phony disease as you might find it in the field.

This (showing picture) is a normal Elberta tree six years old in Fort Valley, typical of a Georgia type of tree. It is very free growing. You will notice a great deal of sky in between the branches of the tree and the rather moderate shadow on the ground in full sunlight at noon. This is a picture of a phony tree in the same orchard, the same day, taken at noon. You will notice there is a heavy shadow underneath it. The general character of the foliage seems to be more dense than it does on this tree, which is a fact. The foliage is of many shades deeper green, the leaves are

large and tend to be flatter than the normal leaf. They do not roll and curve as much, but open up almost flat, and can sometimes be laid perfectly flat on the table. The very much deeper green color makes quite a contrasting tree, and the lateral branches come out in great profusion, making sort of a bushy tree, filling in all the space.

In the center of the tree are many more laterals coming out, the terminals growing about one-third or one-fourth the length of growth of the normal tree, and as the disease progresses and gets older in the tree, the terminal growth may only be an inch per year. Otherwise, the trees appear perfectly healthy as to color. We might remark here that there are no lesions or galls or cankers in connection with this; there is nothing that the eye can detect that might indicate a diseased condition. The tree appears perfectly healthy. If you cut across the limbs or the roots, dig a tree out and examine it, it looks perfectly healthy and sound. The eye detects nothing wrong with it except these characteristics we see in the top in the nature of the foliage. Particularly striking is the deep green color of the leaves and the dwarf character of the tree and the bushy nature.

The fruit characteristics of the phony disease are what constitutes the real loss to the grower. We might remark here that the tree lives on and on and never dies of the phony disease as a primary cause. We have trees on our records that were known to come down with the disease in 1921 and they are still living and bearing crops.

This will show you something of what happens to the fruit. (Picture.). This is fruit from a normal Elberta tree, this is from a phony tree. This is a fair comparison. This picture shows the fruit cut across, showing the pit formations, apparently normal in the phony peach as well as in the normal, but there is a relatively larger proportion of flesh on the normal peach. The seeds of the phony fruit germinate very well. The percentage is equally as good as the normal fruit, and they do not transmit the disease. It is perfectly all right to plant these resulting seedlings,

for they can be top worked to whatever commercial variety is desired with no fear of transmitting the phony disease.

I want to show you a picture of a tree eight years old that is just coming down with the phony disease. This tree, you will notice if you compare it with the normal of the same variety in the same orchard, shows the branches shooting up in the sky. You can see the sky anywhere there. Here we have the skyline dropping down in the first year of the disease, into a more flattened character, with many of the laterals coming out with deeper green foliage, and that is an important factor in determining how long the tree has had the disease. Once a tree takes phony disease, it can never grow normally again and you never can reproduce branches that are pruned away or that may die. Having this long branch out here indicates to any one who is inspecting for it that that tree has recently come down, because that branch couldn't have grown out here had it been phony for a long time. You can also tell by counting the terminal growth of the twigs for the past several seasons, measuring the distance of growth. We can measure quite accurately at what time the disease appeared in the tree.

At Fort Valley we included in our very first year of work in 1921 the usual budding experiment in which we took buds from the diseased tree and budded nursery trees with them, and in the winter we top worked them into normal orchard trees and on nursery trees. We planted the seeds, we did a number of injection experiments in which we ground up and otherwise secured juice from the diseased trees and injected it into various parts of the phony trees.

Certain work had led us to suspect a condition in regard to these trees that should lead us into some new fields. We were facing a very grave problem. Here was an economic situation getting rapidly out of control, destroying the fruit industry in its entirety. The J. H. Hale farm at Fort Valley with 3,000 peach trees was passing from the picture entirely, not because the trees were dying, but

because of their unproductiveness, there being smaller, fewer fruits per tree.

Here is a picture of the tree that came down with phony disease when it was six years old, and a normal tree of the same variety. By this time we found when we budded into a normal tree from a phony tree that the buds, after we top worked them into normal nursery trees, the following summer during the succeeding growth, were normal shoots in the normal tree. On the other hand, when we took buds from the normal tree and topworked them into the phony tree, the resulting growth was always phony and typical of this character of growth. After the bud from the normal tree was put on the phony tree, it made this phony growth. When we took buds from that and put them back in the normal tree, they made normal growth again.

So there was nothing to assume except that it was a root condition, because the top of the tree had nothing to do with it. We then started experiments on the supposition that we had a root condition. Even then we didn't dare assume it was contagious for several reasons. One was that we had made thorough examinations of the tissues of the phony trees by the usual laboratory methods, and we found no bacteria, no fungus in there that could possibly cause the trouble. We found no lesions or cankers or other characters that would indicate that there was a pathogenic organism, an infection of some kind working in the tree. So the one thing we did have to go by to indicate we had an infectious condition was that the disease was spreading, that the local orchards were becoming more severely infected, and that it was marching constantly out into new territory.

We grafted apricot into the phony and normal trees, also almond and a Chinese peach and the plum and other species close enough to the peach so that grafting is possible. In every case these other species would make a phony apricot on the phony tree, a normal one on the normal tree. We found that the different species were reacting to it.

Then we decided to try the root work, and we began working in the dormant season, in the winter instead of in the summer. We did a number of experiments which can be illustrated from these trees. One was to uncover the roots. In both cases we laid them out very carefully so we could root prune very heavily and very judiciously without injuring the tree. We found we could take out 200 pieces of roots three or four inches long without hurting the tree seriously, and that allowed us a number of possibilities for innoculation.

One was to take buds and roots from the phony tree and reproduce that tree, root and branch, and do the same thing with the normal tree. There was a great theory locally that it was a degeneration of the whole peach stock, that they were all going bad, that we needed new blood in the stock, and the growers were very certain that nitrogen had something to do with it, that excess fertilization, particularly nitrate of soda, and stable manure were responsible.

We reproduced these two trees root and branch. Then we took buds from the phony tree and grafted them on the roots of the normal tree, and we took buds from the normal tree and grafted them onto the roots of the phony tree. Now we had roots of little nursery trees here of four kinds of propagation. One row was normal, the other phony on phony, another normal on phony, and another phony on normal. That year we made 15,000 such grafts.

But by September everything was perfectly normal where we had made this combination. You couldn't tell the difference between them. They all looked the same. The following season nothing happened in May, June, and July, and in August everything happened. Wherever we had anything propagated on a phony root or piece of root off by itself where the phony root was involved, grafted on a root in any manner, every tree was down with the phony disease. Where a normal root was involved, every tree was normal, regardless of whether the buds came from a normal tree or not.

In that year, after the results were available, we hadn't come to the conclusion that we had a contagious disease, and that the infecting principle resided in the roots. We had to be very guarded about this, because it is a very unusual thing in diseases of plants to have an invisible germ in the class that we call viruses residing in only one organ of the plant. The usual thing about these invisible germs we call viruses, which are smaller than bacteria, is that they are systematic, that is, they occupy the tissues of practically the entire plant. Still, the seed is an exception frequently, but they are generally considered to invade the entire plant, and very often they are transmitted by the juice. In the peach yellows case, they are not.

So here we came to believe we should classify it with the peach yellows, a virus. We found no fungus, no bacteria, and no lesions, nothing to lead us to indicate a diseased condition. The tissues all appeared perfectly healthy. The only thing we had was deeper green leaves and top characteristics. So for that reason we classified it in the peach yellows group. It differs from the other members of the group in certain important particulars, the principal one being that the trees do not die of the disease. As you are familiar with these other diseases, peach yellows, little peach, and rosette, the infected tree in due time dies. It some times dies in one year after the disease appears. This is often the case with rosette in the south, and it some times dies in two or three years, varying under different circumstances.

Another important difference is that the tree does not appear unhealthy, that is, it has no yellowing or roll of the leaves, no mosaic spots or anything of the kind to lead one to believe you have an unhealthy tree. That is, then, the present classification of the phony disease.

I think we can illustrate some of the features of the disease. Our present view of the disease is that it is caused by a germ or virus which resides in the roots of the tree that in this case does not enter the sap stream or does not migrate above the soil line. It seems to remain in the roots.

But it generates in those roots a toxic-like substance that does have access to the sap stream and that reacts in the top of the tree, that makes the leaves behave as they do, disturbs the physiology of the tree. It develops the trees with lateral branches, and is responsible for the early leafing, flowering, and fruiting, the late leaf fall, etc.

You can replant with safety. You can safely dig out a phony tree and replant a good tree and they won't come down with the disease any higher percentage than for the normal rate in that orchard. A few take it because the other trees are taking it, but not because they are planted in with the normal trees.

This germ, which we call a virus, behaves as though it were a parasite of the living protoplasm of the tree's roots. That is, if you destroy the protoplasm in the cells of the roots, you also inactivate the virus. We truly have a contagious disease of the trees in the roots which develops a toxin which goes into the sap to the top of the tree. A comparison might be that your eyes turn yellow with jaundice, but your doctor doesn't think of treating your eyes, he knows that the trouble is some place else. It is not exaggerating to say that two million trees in Georgia have been taken out by the phony disease.

One word in conclusion as to what we are doing about the control of the phony disease. We have a department working in our laboratory on better understanding of the disease and the possibility of stock that will either resist the disease itself or the insect which carries it from year to year. We also have a very efficient eradication campaign, with forty inspectors, well trained whom we direct at our laboratory, and they under good conditions can inspect 500 trees per week. They have covered the southern states and have removed phony trees where they found them.

We have a quarantine on moving nursery trees, which may be obtained from our Department of Agriculture, which explains that nursery trees grown within a mile of phony

trees cannot be shipped outside of the territory except under certain regulations.

PRESIDENT CARPENTER: The markedly close attention given to Dr. Hutchins' description of the phony peach is a very fitting tribute to the remarkable piece of research work that he has done.

I have great pleasure in introducing Dr. J. R. Magness, Senior Pomologist, U. S. Department of Agriculture, Washington. Dr. Magness will discuss "Some of the Causes for, and the Behavior of Water Core and Other Types of Breakdown in the Apple." Dr. Magness.

DR. J. R. MAGNESS: Mr. President and Members of the Horticultural Society: I think that in order to get a picture of just when some of these so-called physiological troubles develop in apples, I will outline some of the changes that are going on in the fruit just as it approaches picking condition on the tree.

If we started with the fruit from the time of bloom, the increase in volume of the fruit of an ordinary winter variety of apple, would look something like this; starting out here May 1st we would have a relatively slow growth for a period of perhaps six weeks, then a relatively rapid growth, and slowing down at the end. This, we will say, is October 10th, which might represent picking time on an ordinary winter variety.

We have here a period from the time of bloom which in this district would be around May first, up until late June when actual volume increase of fruit is relatively slow. Of course, it appears to be growing, but because of the small size the actual volume increase is rather slow. Then from late June through July and August we have a period when the growth of the fruit is most rapid. That is, of course, if moisture, etc., is available, the growth at that time is at a very uniform rate, and is the most rapid of any time during the season.

During this early period when the growth is not taking place so rapidly, shoot growth is occuring in the trees. The

leaves are increasing in size and expanding, and by this time when rapid growth starts, you have your foliage practically expanded on the tree, and then there is apparently a period of a couple of months when most of the food materials from the leaves are going into the fruit.

Our summer varieties are harvested in a relatively immature condition. Usually we pick our summer varieties while they are still increasing in size at the maximum rate. But with our late varieties such as York, Rome Beauty and others which run on into October, there is some increase in size right through until the end of the season, or until they are picked from the tree. But that increase during the last two or three or four weeks usually is not quite so rapid as it is earlier in the summer.

During this latter period of growth we have a number of changes taking place in the fruit. In the first place, the sugar increases. It is going up for two reasons. In part, it is going up because of material moving in from outside in the leaves, but probably it goes up even more due to the fact that starch which has been stored in the fruit during this period changes over to sugar at that stage. There are a number of other changes going on. The pores in the fruit tend to become corked over, and that is very important from the standpoint of wilting. The more completely that corking occurs, the less the shrivelling in storage.

But from the standpoint of water core and some of these other troubles, probably this sugar increase is the most important factor. Probably all of us have experienced the fact that if these summer varieties get fairly ripe on the tree during a period of warm weather, they tend to break down very badly. They break down right on the tree.

Last summer I examined a large number of red seedling apples, summer apples that were being bred from the standpoint of getting a red summer apple coming into season with Transparent. Almost invariably those apples were showing breakdown in the flesh by the time they showed any appreciable color in the fruit. Apparently the

combination of getting fairly ripe at the time the weather is very hot results in a breakdown in the flesh of the fruit occurring either on the tree or very quickly after the fruit is harvested from the tree. For that reason, if our summer varieties are maturing during a period of extremely hot weather, we are likely to have a great deal of trouble with either water core or with this other form of breakdown which we might call flesh collapse or just the flesh becoming mushy and discolored. Both of those apparently are associated with very hot weather as the fruit is maturing.

Now, if we take our later varieties, our winter varieties, and they are maturing under somewhat similar conditions, that is, conditions of high temperature, we are most likely to run into trouble with water core. We don't know the exact physiological basis of water core, but apparently it is due to the cells more or less swelling up with water until the cell either ruptures, bursts and the water is able to come out of the cell and fill in the spaces between the cells with water.

The ordinary apple runs about 15 per cent air space, or a little more possibly, inside the tissues. When that space in between the cells fills in, we get this water core condition. That apparently develops when we have a condition of high temperature through this period when the sugar content of the fruit is also increasing.

To go into the physiological basis of that would be a little bit difficult, but apparently the sugar content of the cell, that is, the higher the sugar content of the cell the greater the attraction of that cell for water, and we may reach a condition where the cell will take up so much water that it ruptures and the entire cellular spaces become filled with water.

The experimental work that has been done on water core has shown a very close correlation between water core and high temperatures. The fruit on the south and southwest sides of the tree is where you usually find the most water core. Frequently it is the largest and finest fruit on the

tree that develops it, because it contains the highest sugar content. With most varieties, if we run into extremely warm weather during late September and early October, we can begin to watch for water core. If you examine the fruit on the southwest sides of the tree, directly exposed to the sun where it reaches the highest temperature during the day, and fruit in that position is not water cored, you can be pretty sure you don't have water core in the orchard. On the other hand, if you are simply examining fruit down on the lower branches, more or less in the shade, and don't find water core, it is no assurance you don't have it in the higher branches of the tree.

Water core is apparently not due to excess of water. We are more likely to get it under dry, hot conditions than we are under conditions of sufficient moisture supply. The sugar content of the fruit, which tends to increase somewhat under these moderately dry, hot conditions, is associated with the development of water core in the fruit. So that the correlation of water core is with relatively hot, dry conditions rather than with conditions of abundant moisture supply.

The only recommendation, the only remedy that I know for water core is to watch this development in the orchard and to harvest the fruit as soon as the water core begins to develop. If you examine the fruit in the portions of the tree that are most susceptible, and when you begin to find an appreciable amount of water core in there, get your crop off as promptly as possible, and you will reduce water core as much as it is possible to reduce it. It tends to increase in the fruit, the longer the fruit holds on the tree. Once it is started, the longer the fruit holds on the tree, the riper it gets, the higher the sugar content, the more water core will develop.

There is some evidence that a small amount of water core in the fruit will be absorbed at the time of storage. That is, if you have very small spots, that moisture will be taken back into the cells, and the fruit which shows a trace of water core at picking time may not show any after two or

three months in storage. However, if very large areas are involved, if you have a good-sized spot in the apple, it will not be taken up, and of course, it greatly detracts from the quality of the fruit. Consequently, from that standpoint I think if you watch for water core and pick early, especially if you have hot, dry weather during the growing season, that is the most practical remedy for water core.

We have one or two other conditions in the fruit we might just mention. A good many of you during the past year or two have had trouble with so-called drought spot. That is a condition of tissue, especially in toward the core which becomes brown and corky. That apparently is due simply to shortage of water. When the trees get extremely dry the water in the fruit tends to be pulled out by the leaves, the fruit tends to shrivel somewhat, and as a result of that in many varieties we get this corky development around the core.

That may occur at any time during the period of development of the fruit. I have seen apples in the past, particularly in the northwest, completely ruined by drought spot before they were a half inch in diameter, and we saw plenty of them in this section of the country last year which were ruined by the drought conditions that came on in late August. Apparently that drought spot condition may develop at any time that the tree gets extremely dry, and there again we have no practical remedy for it except to supply moisture, or to manage the orchard in such a way that extremes of moisture shortage will not develop.

There is one additional type of this breakdown which is extremely important and upon which we have even less information than on drought spot or water core, and that is the so-called bitter pit which was rather serious this year on certain varieties, and especially bad on Baldwin and some other varieties practically every year. This bitter pit is, I think, familiar to all of you. You get slight depressions or spots in the surface of the fruit which remain green as the rest of the fruit tends to yellow up. If you cut under

these spots, you will find a corky deposit underneath, which tastes quite bitter. That is where it gets the name bitter pit, or Baldwin spot, as it is sometimes called.

That apparently is also associated with a nutritional condition within the tree. It usually is worse on trees that are very vigorous than where we have only a moderate amount of fruit on the tree, so that the fruit gets to be very large, and in some cases highly colored, fine looking fruit. It isn't limited entirely to that type of fruit, but on the whole, your trees that are in very vigorous condition, with large-sized fruit, are more likely to show this spot.

Now, these three conditions, water core, drought spot, and bitter pit which occur in the orchard prior to picking, are all extremely important from the standpoint of commercial value of the fruit. None of them, however, particularly directly affect the storage quality. Water core in some cases may lead to an earlier breakdown in the fruit in storage, although there is some uncertainty even in regard to that.

The bitter pit and drought spot do not particularly affect storage quality, although, of course, they do affect the commercial value of the fruit.

PRESIDENT CARPENTER: At this time I want to announce several committees, and would ask that the chairman of each committee be prepared to bring their report before the meeting tomorrow morning.

RESOLUTIONS COMMITTEE

J. ANDREW COHILL, JR., Chairman

W. LEE ALLEN E. D. MCCAIN

AUDITING COMMITTEE

M. D. MOORE, Chairman

H. C. WHITEFORD T. J. HEAPS

NOMINATING COMMITTEE

J. WALTER ENGLAR, Chairman

GEORGE W. KEMP ALBERT ALLEN

DWIGHT WALKER AARON NEWCOMER

Our next speaker is Dr. E. N. Cory, State Entomologist.

Dr. Cory.

CODLING MOTH AND SAN JOSE SCALE—TWO ORCHARD PESTS DEMANDING CLOSE ATTENTION

ERNEST N. CORY, College Park, Md.

I find myself in agreement with many of the things that Mr. Simpson said this morning. He told you in the beginning that one way in which to reduce cost was to improve the quality of our fruit, and certainly that is essential. As to the reduction in the costs of spraying, I agree with him in some respects, and I will take those matters up a little later.

Certainly the codling moth is a serious pest. The survey which we conducted last year showed for the commercial orchards that were examined an 18 per cent average codling moth injury. That didn't mean, of course, that that was true in every orchard. Some orchards had practically no codling moth. Others ran very high. But the average of 18 per cent, I think, represented very fairly the condition last year.

This year an examination of eighteen commercial orchards disclosed 6.94 per cent actually wormy fruit.

There was a considerable amount of injury of what we call "stung fruit" that was very serious. It emphasized what Mr. Simpson said about timeliness of spraying. In just the short period between the 10th of June and the 15th of June, a very heavy hatching of the codling moth occurred with the result that the spray residue having been removed by recent rains, there was puncturing of the fruit in spite of the real timeliness of the previous sprays. If you could have gone over and sprayed continuously, you probably could have stopped that stinging of the fruit, but that, of course, is impossible.

TABLE I

Western Maryland

Orchard	Variety	Stung	Wormy	Stings and Worms	Clean
1	Jonathan	.....	.....	.....	100.00
2	Jonathan	3.17	.....	3.17	96.83
2–a	Grimes	16.82	.....	16.82	93.18
3	Grimes	2.69	.....	2.69	97.31
4	Grimes	6.26	.....	6.26	93.74
4–a	York	4.89	.93	5.82	94.18
5	Jonathan	5.20	.....	5.20	94.80
5–a	Grimes	8.36	.....	8.36	91.64
6	Delicious	7.76	.....	7.76	92.24
7	Grimes	4.36	.....	4.36	95.64
8	York	8.40	11.90	20.30	79.70
Average....				7.24	92.66

Central Maryland

	Variety	Stung	Wormy	Stings and Worms	Clean
9	Rome Beauty	36.90	3.70	40.60	59.40
9–a	York	27.80	3.87	31.67	68.33
10	Stark	43.00	.....	43.00	57.00
10–a	Jonathan	11.86	.....	11.86	88.14
11	Jonathan	17.50	.....	17.50	82.50
12	York	58.40	.....	58.40	41.60
Average....				33.83	66.16

Eastern Maryland

	Variety	Stung	Wormy	Stings and Worms	Clean
13	Stayman Winesap	16.00	16.00	32.00	68.00
14	Golden Delicious	28.00	11.00	39.00	66.00
14–a	Stayman Winesap	20.00	11.00	31.00	69.00
15	Stayman	28.00	1.2	30.00	70.00
15–a	Stayman	19.00	.91	19.91	81.9
16	Stayman	28.56	5.38	33.94	66.06
16–a	York Imp	27.2	10.4	37.60	62.40
16–b	Golden Delicious	.56	.....	.56	99.70
17	Stayman	11.00	8.3	19.30	80.70
18	Winesap	85.9	4.7	90.60	9.40
Average....				33.39	67.22

There are three things we might do to remedy this condition. One, better spraying; two, we might use supplementary sprays, and three, we might adopt methods for eliminating the carryover. All of those things were mentioned this morning.

Now the first—in order to plan the work we are trying to do along these various lines, I want to show several slides illustrating what happens when we have an excessive number of codling moths in a packing house, and the methods we use for determining how we can reduce the winter carryover.

The tests of washes to kill overwintering codling moth larvae were conducted on 23,187 larvae spun up in 2-inch cardboard bands. The treatments were made in the spring and checked against similar bands treated with water and with concentrated lime sulphur. The checks showed an average of 10.73% for three lots treated with water and the concentrated lime sulphur 1-2 showed 11.57% mortality. Natural mortality of worms held in screen wire cages held in the orchard, based on 2,358 worms, was 2.6%. Inside the packing house the natural mortality was 3.18% based on 2,519 worms.

The results from these experimentally tested bands cannot be expected to represent the kill that should be expected in the orchard or in the packing houses, but represents the type and kind of materials that should be tested further.

(NOTE: See Table II on next page.)

I think there is no question about sanitation. There is some question so far about substitutes. So far as I know, there is no adequate substitute for arsenate of lead. There have been a great many experiments with the use of various materials in summer as substitutes for arsenate of lead. In some sections they have given fairly good results. Here where we use so much sulphur, it is very doubtful whether we can use the oil, and it is doubtful whether some of the other materials are economical, even though they may give a reduction. Last year we tried fluosilicates and con-

TABLE II

Tests Against Over-wintering Larvae Inside Their Hibernacula

Materials Used	Date Treated	Date Examined	Emerged	Larvae	Dead Pupae	Dead Total	Dead
Emulsions and Soluble Oils							
Sunoco 1-20	Apr. 17	June 27	50	3	2	55	9.09
Sunoco 1-20 plus PDB	Apr. 17	June 27	83	6	11	100	17.00
Sunoco 1-10 plus PDB	Apr. 17	June 27	59	14	12	85	30.58
Kleenup 1-20	Apr. 17	June 27	30	0	1	31	.....
Kleenup 1-20 plus PDB	Apr. 17	June 27	56	1	12	71	18.30
Kleenup 1-10 plus PDB	Apr. 17	June 27	35	27	2	64	43.75
Kleenup 1-20 plus PDB and 10% CCl-4	Apr. 17	June 27	176	6	14	196	10.20
Scalecide 1-15	Apr. 17	June 27	44	33	13	90	51.11
Scalecide 1-15 plus PDB	Apr. 17	June 27	120	17	28	165	27.27
Barko 1-15	May 9	June 27	66	117	55	238	72.26
Tar Washes							
Barko 1-15	Apr. 17	June 27	109	10	24	143	23.77
Barko 1-15 plus PDB	Apr. 17	June 29	13	41	2	56	76.77
Barko 1-7½ plus PDB	Apr. 18	June 29	6	56	0	62	91.95
Long Ashton Tar Wash 1-5	Apr. 18	June 29	39	11	45	95	58.94
L. A. Tar Wash 1-15 plus PDB	Apr. 18	June 29	31	8	11	50	38.00
L. A. Tar Wash 1-7½ plus PDB	Apr. 18	June 29	103	9	70	182	43.40
Solignum 1-15	Apr. 20	July 2	179	6	13	198	9.59
Solignum 1-15 plus PDB	Apr. 20	July 2	85	4	28	117	27.36
Pine Oils							
Pinetrex 1-15	Apr. 18	June 29	51	1	6	58	10.71
Pinetrex 1-15 plus PDB	Apr. 18	June 29	361	38	60	449	21.82
Pinetrex 1-7½ plus PDB	Apr. 18	June 29	334	24	20	378	11.64
Pineol Soluble 1-15	Apr. 20	June 29	134	10	38	182	26.37
Pineol Soluble 1-15 plus PDB	Apr. 20	June 29	140	67	37	244	42.62
Pineol Soluble 1-7½ plus PDB	Apr. 20	June 29	6	39	40	48	87.50
Pineol Soluble Straight	May 9	July 2	2	555	3	597	99.66
Pineol Soluble 1-2	May 9	July 2	39	520	53	612	93.62
Concentrated Lime Sulphur and Checks							
Conc. Lime Sulphur 1-8	Apr. 20	June 27	107	3	11	121	11.57
Check	Apr. 20	June 27	125	7	9	141	11.34
Check	Apr. 17	June 27	54	0	6	60	10.00
Check	Apr. 20	July 12	511	16	45	572	11.93

tinued the tests this year following the regular arsenate of lead application in the hopes that we could reduce the amount of wormy fruit.

The results were indeterminate owing to the excessive amount of fruit stung in June. In most cases, the fluosilicate gave slight reductions in the amount of wormy fruit.

I want to say one more thing in regard to thoroughness of spraying. There is no question but what, as Mr. Simpson said this morning, scab, codling moth, and scale must be controlled by thoroughness, and I believe that we are falling down to some extent in some of our orchards in the matter of thoroughness. We have larger residue than we had last year or a few years in the past, and yet, we are attempting to do a job of spraying depending upon volume of spray and pressure rather than devoting the proper amount of time to reach each tree. You cannot go through an orchard and spray that orchard in jig time. If you have codling moth, San Jose Scale, or scab, you have to give enough time to each tree to do the work thoroughly.

We are getting into some of our difficulties, I believe, largely through the almost general abandonment of the spray tower. Most anybody can do a good job of spraying with a sprayer equipped with a tower if he stops at each tree, but it takes a very expert operator to do a good job, spraying from the ground, depending upon volume and pressure to get to the top of the tree and to get inside of the tree. You have to cover the entire tree and do a thorough job, as well as do it in a timely way.

The next portion of my talk has to do with the San Jose Scale, and again the question of thoroughness enters into the manner of control of the San Jose Scale. I think it would be well if I told you briefly about the life history of the San Jose Scale. In May the males begin to emerge, and in June, the female scales begin to produce young. It has been estimated that a single scale can produce in six weeks, 600 young. If you just start with June 1st and figure that out, you have 600 scales by July 15th. Assuming

that half of them are females, then by July 15th you would have 600 times that number, or 180,000 scales, and in the third generation you would have 54,000,000 scales. If you cut your estimate in half, that is, 300 young, and go on to the next generation, you have something over one billion.

That gives you an idea of the tremendous fecundity of this insect. In the last few years we have been having a great increase in the number of degrees of temperature above the normal. Dr. Langford has figured out for me from the records, the temperature average for this territory. The temperature in Washington and vicinity has been far in excess of normal during the years of 1927 to 1930. On October 1st the excesses from January 1st were as follows: in 1927, 123 degrees, in 1928, 94 degrees, in 1929, 486 degrees in 1930, 941 degrees, with an average of 411 degrees above the normal. These excesses were increased from October 1st to December 1st to an average of 613 degrees.

Not only have we had this increase in the number of degrees above the normal, but we have had a difference in this four-year period of twenty days right here in College Park, in the time between frosts. That has its bearing also upon the increase. Is it any wonder we get San Jose Scale? I don't care whether you use lime and sulphur or oil to kill the scale, if you do a thorough job you will kill all the scale. It has been amply demonstrated time and again by growers that they can control the scale if a thorough job is done. But in the face of this increase in temperature, allowing for the undue multiplication of the scale, any ommission of a scale spray at this time, or any omission last year or the year before, back to 1927, means you have had a tremendous increase of scale in the orchard, that you can't hope to wipe out in one year any more than you can wipe out codling moth in one year.

Dr. Hough made a very careful study of the situation, and he said it takes at least two years of the most thorough spraying to get rid of the codling moth, and it will take

two years to get rid of the San Jose Scale. On the other hand, you could spend ten years and not get rid of it if you didn't do a thorough job.

PRESIDENT CARPENTER: We want to thank Dr. Cory at this time for his splendid talk, and I also want at this time to stress one feature of the work that Dr. Cory is doing, and that is the checkup on the work of the commercial orchardists as far as control results are concerned. I think it is a splendid thing for the station workers to have this information available for the fruit growers, and at the same time, I want to publicly commend the work of Dr. Cory's staff in Western Maryland. Mr. Graham has done excellent work and used great tact and perseverance in working with the growers, and I feel that at this time nothing but good will result from his work to all the growers in that section, and that the results which have been shown in the control of codling moth have been greatly influenced by the work that he has done.

The meeting stands adjourned.

The meeting adjourned at four-thirty o'clock.

TUESDAY EVENING

January 5, 1931

ANNUAL DINNER OF THE SOCIETY—DEDICATION OF NEW HORTICULTURAL BUILDING, UNIVERSITY OF MARYLAND

SENATOR W. EARLE WITHGOTT, Vice-President, Presided as Toastmaster

TOASTMASTER WITHGOTT: Ladies and Gentlemen, it is a pleasure to welcome you all here this evening. I wish to call on a friend of mine who has gone out of his way to favor us with his presence. He is a member of the Board of Regents and is your representative as well as the chairman of the Campus Government Committee. He has had

a good deal to do with the securing and the development of this building. When the money was appropriated, he was the speaker in the House of Delegates, and it was largely through his efforts, and those of Dr. Auchter, Mr. Walker, Mr. Harrison, Mr. Carpenter, and others that we have reason to celebrate here tonight. The speaker is here as a representative of the Governor of this State, who so generously included the appropriation for this building in his budget, and as a representative of the present Governor we all wish him well, and we hope that the next time we have a meeting, that Governor Ritchie will be here in person. Hon. E. Brooke Lee.

HON. E. BROOKE LEE: Senator Withgott, President Carpenter, Dr. Pearson, Ladies and Gentlemen: I will be brief.

This building is built by the campus committee for the Regents, exactly as your representatives wanted it to the extent that the money available allowed, and we can take no credit for what I am reliably advised by experts, is a very excellent plan and will serve the purpose which it is intended to serve, particularly when it is fully equipped. We will co-operate to the fullest extent possible on the additional or new equipment for the building, a great deal of which I am equally reliably advised, is not yet in place, and for which the money is even not yet appropriated.

A great college is being built here now, and this new up-to-date and really great building is merely an appropriate part of the whole picture here at College Park. I hope you had time to see the new plan here during the day, but if you didn't, I will say this building is located on the state highway side of a new northern campus, and on the western side of the new campus are the new women's dormitories, one of which is finished and open for occupancy, and the second is about to be started. There is a new women's field house on the same general campus with an adequate athletic field and exercise field for the use of the women students.

Additional men's dormitories are projected from the

coming Legislature, and an adequate men's field house is being completed. A new library and administration building has been completed, and an adequate addition to the engineering building is now being finished.

I would be glad to talk to you about horticulture and tell you how good and important your own work is if I knew anything about the subject. I realize that it is very difficult, because my father gets most things ripe, but he never gets his horticulture ripe. The only exception is his grape crop. His apple crop is not so good because of one or more lacking sprayings. We have apples now all the time during this season because of the depression and due to the bounty of nature last summer, but you can generally find a different kind of worm in each of our apples. I am advised that is because we missed the third or fifth spray, and I admit that I am completely confused about the technique and the practice of your great, progressive profession, except that we have to have it, and we understand you are making an excellent job of it. The building is here to help produce a better answer to the needs of the horticulture people of this State, and those of us who don't understand your science but appreciate it, will continue to co-operate to the limit to help you work out your problems in the future.

TOASTMASTER WITHGOTT: It certainly is with a great deal of pleasure that we greet all of you here tonight at the dedication of this new Horticulture building. It is a great pleasure to enjoy this wonderful dinner and to be here in the present of all of these fine looking ladies. We have just passed over 1931, we hope forever, and we are standing on the crest of the wave and can swim into 1932.

I am sure we all wonder just what might be in store for us. There is nothing as uncertain as the future. It is laden with opportunities and possibilities, and pregnant with disappointments which I hope none of you will have. So isn't it a very fine thing for us just to take stock, to take a little inventory and learn a few of our many weaknesses

and build for tomorrow? I believe it was with this idea in view, a few years ago when quite a number of gentlemen who were interested in horticulture saw just what would be needed in a few years to come. We have all kinds of pests, insects, and diseases with which we must contend, and in order to do it, we must have a place to do it, and we must have adequate equipment. I think the achievements you have made have been miraculous, and we are going to do bigger and better things in the future.

So, my friends, tonight we are endeavoring to dedicate this building with enthusiasm, and in the belief and the knowledge that so long as the fruits retain their juices and the flowers their fragrance, that this building shall grow in service and in popularity.

The speaker who is going to follow me is an old friend.

It is indeed with a great deal of pleasure that we will hear now from Dr. Patterson, who will tell us the relation of the Experiment Station to Horticulture. Dr. Patterson.

DR. H. J. PATTERSON: Senator Withgott, Mr. President, Ladies and Gentlemen of the Maryland Horticultural Society: It is indeed a pleasure to have you here on this occasion. We regard this building as marking a distinct epoch in the development of horticulture in Maryland. It is really a monument to your business and a monument to your energy in procuring a building in which to house equipment for conducting research and educational projects to further your business.

I wonder if you people realize that in our research work in connection with horticulture we are using as tools nine or ten distinct sciences, and when you realize it from that point, you can readily understand why horticulture should have a building of this size, and you will all the more realize that it is essential to have these laboratories well equipped with the apparatus and things so as to handle those sciences and make them really servants of your business.

A good many people think of horticulture only as growing

orchard fruits, but you must also realize that we have a big vegetable and canning industry to provide for, a large interest in small fruits, a big interest in floriculture and ornamental horticulture, and all of these things have their problems that require research, and there is more and more demand all the time for education in those various needs or fields.

Now, I believe my subject in proper was to say something about the relation the Experiment Station has had to horticulture in this State. Practically all of you are too young to remember the agricultural conditions which prevailed in this section back thirty or forty years ago at the time the experiment station movement was inaugurated in this State. Agricultural prices were about as low, or the same as they are today. We had one marked difference, that even though wheat was low in that period, it nearly purchased a day's labor on the farm. Today it will not do that.

That condition made the farmers through many parts of the state hunt around for a different cropping system. It was at that period too, when the yellows had pretty nearly wiped out peach growing on the Eastern Shore. It was at that period when the San Jose Scale made its first appearance in our midst, and the fruit farmers were asking what could be done to protect that industry. The entomologists came to the front, and after numerous trials, did make a spray that has enabled you to protect yourself against the ravages of the San Jose Scale.

It was at that period when the pea louse made its first cycle in the State, and the farmers and canners felt that they were going to be wiped out of business. These and other diseases show that the help the experiment station could give in solving those problems, the inspiration which the experiment station gave towards the growing of better fruit, the first work in demonstrating to the people of Maryland that they could grow as good fruit as could be grown anywhere in the United States by taking some of these well-known and well-sprayed products to the inter-

national shows and taking prizes with them—that really awakened them and gave the real inspiration and impetus to fruit growing in Maryland.

We do not claim that the experiment station did it all, but they worked with you and helped you and your fathers towards doing the thing and putting the industry on a good basis, and in that way it has helped much towards the upbuilding of the industry.

I can remember very well that many of the mountainsides that are now growing splendid fruit, both peaches and apples, were in scrub timber and on the tax books at fifty cents an acre.

Some of the recent contributions which the experiment station has made to fruit growing and horticultural interests are of really outstanding value. I would call your attention to the work in rejuvenating the peach orchards, some results which have been published recently which show conclusively that by the proper methods, the varying life of a peach orchard can be increased ten or more years beyond what has been the normal practice. Now, that means a great deal to people who have invested money in peach orchards. The proper fertilization of peach orchards in connection with that line of work is really worth while.

The survey in connection with the growing of canning crops and the cost of producing and canning and distributing canned crops is a really worth-while contribution. The better methods of spraying and controlling insects and plant diseases that have been devised in recent years are worth-while contributions. The contributions of developing disease-resistant varieties of tomatoes and peas I regard as of immeasurable value to the horticultural industry. But I did not want to tire you with all these details. However, I believe that if you examine the contribution which has come as a result of research in connection with our various horticultural projects, that you will find that they are paying very handsome investments on the cost. In fact, if we were assured always of investing our money in things

that would pay as big dividends as the results of research that has been conducted in the horticultural field, I think we would all be exceedingly happy.

If your problems are to be met in a big and progressive way, I am quite sure you want to see them so conducted—you will find in your efforts towards getting a building of this kind, and the effort which you will put forth in providing the kind of equipment for the utilization of all the sciences in your behalf, will be more worth while, and will make this State one of the outstanding States in the Union for horticultural education, and in horticultural research.

TOASTMASTER WITHGOTT: After hearing Dr. Patterson talk I have become an optimist.

It gives me a great deal of pleasure to present to you at this time, Mr. Lee Allen, who will tell you of "The Interests of Maryland Fruit Growers in the New Horticultural Building." Mr. Allen.

MR. LEE ALLEN: Mr. Chairman, Members of the Horticultural Society: A great many of the fruit growers at the present time find themselves in a situation somewhat similar to that of Mr. Murphy, who until recently was a section hand on the railroad. Mrs. Flanagan came over to visit Mrs. Murphy, and she asked, "Was Mr. Murphy in comfortable circumstances when he died?"

Mrs. Murphy said, "He was not. He was half way under a train!"

Regardless of the fact that some of us are caught half way under a train in some respects, I think we can say we are all very happy on the occasion of the dedication of this building.

I have just three things I want to say in regard to this occasion. One is, we are glad to be here, because we have a horticultural building, and the second is, we are glad to be here because of the kind of horticultural building that we have, and third, we are glad to be here because of the use which we expect to make of this building.

Now, in regard to this first point. Our chairman tonight has been very, very generous in his praise to the Horticultural Society and various members of the Society in regard to his appreciation of their efforts in getting this building, and to a very large extent, it is correct. The movement for this horticultural building started in the Horticultural Society. There were several resolutions passed before we even began to get anywhere. A number of growers, especially our president, have been very active along this line, but I want to tell you that the man more responsible for this building is our chairman, Senator Earle Withgott. Senator Withgott was ably seconded by Senator Fooks. He was also ably seconded by others, but the contact man between the fruit growers and the people who had the say as to whether the money should be appropriated or should not be, the contact was made through our chairman, and I am very happy to have this opportunity to publicly acknowledge the gratitude of the fruit growers to Senator Withgott.

Now, the second thing is the kind of horticultural building which we have. We have learned to expect nothing but the best of Dr. Auchter. We have found that whatever he undertakes, at least, whatever he has undertaken, has been of the very highest order. We have had a lot of emphasis on research. I wish, as you go through this building, that you will just notice the emphasis put on research in the spacing and planning of this building. We have a very excellent building, and I think probably have gotten more for our money than we could have gotten with any man who did not know just exactly what was needed.

The third thing, the use to which we can put this building: I was very much interested a few days ago in reading an article by an economist. He was criticizing a statement that certain industries were basic, and that before the public could regain its normal prosperity, or that after the country did regain a measure of normalcy, that certain industries would have to be adjusted, so that this or that industry could offer a good living to the members engaged in that industry.

The position taken by this economist was that that idea was absurd. One of the industries he mentioned in particular was the livery stable industry. That was an honorable occupation, yet, it is practically out of existence. The musicians have done a lot of advertising and talking, but I understand their activities are very seriously curtailed by the radio. We all feel sorry for them, but if the musicians don't do something about it, nobody will.

We all enjoy eating apples, but we don't have to, to be really honest about it, eat apples. I imagine that people might not live as long, might not get as much enjoyment out of life, but people would live. Wheat is one of the great basic industries, and we want wheat, but I imagine we could exist if there wasn't any wheat grown for a number of years. Rye, barley, and all sorts of things would take its place.

The point he made is that our industry is not going to be taken care of by any one else. They may feel sorry for us, but they are not going to pay one dollar a bushel for apples if they can get them for seventy-five cents a bushel, just because the industry needs help.

It seems to me that this horticultural building should be, and can be, and I hope will be, a rallying point for the horticultural industry of this State. I don't want to encroach on the rest of them, but I am speaking primarily to the fruit growers at this time, and I hope the other lines will make it a sort of general camping ground with the fruit growers, in the use of this building. We don't want to minimize the importance of teaching, of having the students in horticulture miss anything, get anything but the very best, but to be perfectly honest with ourselves, the interests of the fruit growers as fruit growers is in the research department.

We have here the possibilities of research, as has been mentioned before; the horticultural staff of the University of Maryland has accomplished wonders with limited equipment, and we expect they will accomplish even more with

such equipment as this. We are fortunate in having a building here, having our staff here, being so close to Washington, so that Dr. Woods and Dr. Auchter haven't entirely gotten away from us, and we hope they won't. We have right here at our hands the staff of the U. S. Department of Agriculture, and so I say, I hope we can make this building a rally point for the fruit-growing industry of this State.

This building, I think, will help stimulate the morale of the fruit industry, and it needs stimulating now. I hope the fruit growers and horticultural staff will co-operate in making this building the center of the fruit growing industry of this State, and that the result will be that our feeling of 1931 will be forgotten.

TOASTMASTER WITHGOTT: I am publicly going to thank Mr. Allen for his kind words. Just a little bit of courage, and confidence, and self reliance, and good old-time hard work are the principal factors that are going to bring us good times.

There are in Maryland over 400 canning factories, their products amounting to not only millions of dollars a year to the farmer, but also in the manufactured form, and they will be a very important factor in this horticultural building in the experimental work, processing, in controlling various diseases, etc. It is my great pleasure to call on another colleague, Senator N. H. Fooks, of Preston, who is as familiar with this industry as any man in the State of Maryland. Senator Fooks.

SENATOR N. H. FOOKS: Senator Withgott, Dr. Pearson, Ladies and Gentlemen: I shall say what I have to say in a little more serious vein, and I trust you will bear with me a few moments while I try to tell you what I have on my mind.

A few years ago when I came to a meeting over here in a stable across the road, I promised that I would help get a horticultural building. I did what I could. I am glad to be here tonight for the dedication of this building.

A building of this kind has provisions in it for carrying on experimental work in canning research. Dr. Auchter showed me the room this afternoon, and asked me to give some suggestions as to the equipment of it, which I am sure our association will be glad to do.

Well, you have a building here, a fine corps of men to operate it, but it will not amount to very much unless you can carry the message out to the people throughout the State, especially to the farmers and the canners. I have in mind at the present time, and have had for some time so far as the counties are concerned, the improvement of the basis of canning crops, namely, the improvement in the seed that we plant in the ground to produce the crop. If you want a nice apple, you plant a certain variety of fruit trees. It is the same way with growing stock and other things. You breed your product up to the highest point you possibly can.

This work has been carried on quite extensively in the tomato. Some very creditable work has been done in that industry, and something, I think, of quite a lot of value to the State, the farming industry, and the canning industry. I do think this can be carried even further, particularly in sweet corn seed. Last year the company I am associated with paid out $44,514.41 for seeds grown outside of the State of Maryland. That was almost 40 per cent of the cost of this building.

The point I want to make is this, that if we cannot grow all of these seeds, why can't we grow a part of them? Connecticut is not a corn-producing State, yet, when I was up there on a visit a couple of years ago with Dr. Jones, who devotes practically all of his time to improving corn for seed purposes, I was amazed to see 15 or 20 acres of every conceivable form of experiment in seed corn growing, even the corn in the original state, which grew on a little tassel, up to an ear of corn, and you could see all these various things.

Another thing. I don't think I can illustrate my point without reading you a little something here which I got

out of a book by Luther Burbank, who was the same thing to the horticultural world that Edison was to the electrical world. I will omit part of this, I just want to give you a little experience in growing peas. These are his own words from this publication: (Senator Fooks read an extract from Mr. Burbank's book.)

SENATOR FOOKS: I have been told you could not grow sweet corn in Maryland for seed. My experience was with Professor Kemp, who was helping me at that time. I worked with him and we developed corn to the point where there was practically no starch in it, and we ran our yield down to the point where it was 24 cases per ton. We had our starch content down to the point where they told us we had only 17 per cent on an average. That is the lowest I have ever seen in any commercial seed, and it runs from 17 to 40 per cent starch.

I believe this college, with its corps of men with the equipment you have, can do this work on an experimental line with practical results to some of the canners and farmers. It is very desirable to have at least 35 per cent starch content in corn to make it cream up properly. My experience in this is, I have brought my starch content so it does not vary over 20 per cent. Before, it varied from 17 to 50 per cent. I am safe in saying I have my starch content now 25 to 35 per cent, and I believe by carrying on these experiments that you can help the farmer and canner, and I am convinced that you can grow every seed crop that is grown in the United States, in Maryland, just as cheaply as you can grow it anywhere in the United States, and that a great revenue, at least, some revenue can be gotten by our farmers here, and we will probably have a more dependable source of seed than we have had in the past.

TOASTMASTER WITHGOTT: As a mighty oak grows from a little acorn, perhaps the seed business in Maryland can grow from the seed of thought Senator Fooks just gave us.

We all love flowers. Mr. Merritt, who is going to talk to us on this subject, I hope can explain what we are going

to do this spring when all the flowers which are now in bloom have gone. On Christmas Eve, I picked a bunch of wild violets from the yard. Mr. Merritt, if you will tell us something about the subject, we will appreciate it very much.

MR. MERRITT: Mr. Chairman, Dr. Pearson, Members and Friends: First, I want to say I am a specialist. That relieves me from answering questions. We only grow hydrangea bushes.

I am substituting for Mr. Ekas. He asked me to convey his regrets for not being here tonight, and also, to express his sincere sympathy for you folks in the audience who might have to listen to me for the next hour.

I was just recently elected president of the Florists Club, and we are getting ready for an annual dinner. That is one of the reasons I accepted so willingly to make a speech. I have to make a speech there, and thought I could come down here and practice a little bit.

My subject is "Floral Crops." I don't believe there are many florists in this audience, so I believe I will be safe in talking on floral crops. I don't believe, outside of the president, many of you could contradict me, but I don't think I should take up your time tonight speaking of floral crops.

I want to congratulate the University on having this wonderful building, and I want to thank Dr. Pearson, Dr. Patterson, Dr. Symons, and all who are co-operating with the florists. We are going to have a short course down here, and we are going to co-operate with the University, and I think in the future you will see a whole lot more florists in your society than you have at the present time.

TOASTMASTER WITHGOTT: Maryland is mighty proud of her nurseries, and the next speaker is the son of the late Orlando Harrison, who devoted his life to the nursery business and to everything that pertains to horticulture. It is my pleasure to call on Mr. Joseph Harrison, of Berlin, who will talk on "Nursery and Ornamental Horticulture."

MR. JOSEPH HARRISON: Mr. Chairman, Dr. Pearson, Ladies and Gentlemen, Members of the State Horticultural Society: It gives me great pleasure to be here representing the nursery industry of Maryland. Maybe I can say a few things about what the Experiment Station is doing, which helps us every year.

One of the things the Experiment Station is developing, is certain disease-resistant stocks in the orchards, and this is most important. One of them is the blight resistant stock for pear trees, for the blight was doing away with the pear industry to a very large extent in the eastern part of the country, and I understand it is the same in the west. This blight resistant stock shows very much promise at the present time. It is being used to a very large extent by most nurseries. But I think any one who plants it should not rely entirely on his stock being wholly resistant, but they are much better than the previous stock.

The next thing would be apple trees. Quite a bit of research has been carried on in that line, not particularly in Maryland, but in other States, and we are hoping that Dr. Gardner and other members of the staff here at the University of Maryland are going to develop stocks which show much better results than the ones previously developed.

Then we go over to the ornamental side. Just at this time the nursery men of this country are more or less in the same predicament as the fruit grower. Several years ago before importation embargoes were brought about, we could import almost any ornamental plant in the United States at such low prices that it didn't warrant American producers competing. But since the quarantine is in effect those same plants are being produced here in this country more cheaply than in Europe.

That has brought up several problems to the American nurserymen in the treatment of seed. Quite a bit of work on the treatment of ornamental seed in this country has been done by the Experiment Stations. This station has done something, for instance, on the growing of apple seeds.

During the past six years there were very few apple seeds grown in this country. At the present time our entire production of apple trees is grown in America from American seed. There was a saying that the French grow better trees. I have my doubts about that very strongly. Most of the apple seedlings are grown at this time in Kansas or the State of Washington, but we are growing some now in this State which I believe are some of the first apple tree seedlings grown in the United States east of the Mississippi River.

Then to go to the treatment of certain cuttings for ornamental plants. This station has done quite a bit of work on that line which has helped all the nurserymen in the State. Treatment with certain kinds of chemicals which causes better growth and things of that kind have been done, which certainly helps us out.

Then we go to the storage of nursery stock. There has been quite a bit of investigation carried on in regard to what temperatures, humidity, etc., should prevail for storing nursery stock. This, I think, is going to help us all, because we are going to be able to give the fruit grower a better tree later in the season. Those things help us all in every way.

Then we go over to the spray materials; sprays for nursery stock, and fumigating. I think this Experiment Station has done quite a bit of work on the boxwood. We have had quite a bit of trouble here in previous years with boxwood leaf miner. That, I think, is more or less corrected at the present time.

But as soon as the Experiment Station winds up doing one thing, the nurseryman always has someting else for him to work on. They never run out of jobs. I think the nurserymen should be very proud of the work which the extension service is doing here in the line of horticultural education so far as ornamental plants are concerned. We have here a very able landscape architect doing excellent work through the rural schools, which in turn, reflects

back in the nursery business in more ways than one. We have that to contend with all the time, correspondence coming in to the office wanting to know who they can get to come to their school or their community club to talk about landscape planning, small fruits, and everything of that nature. I want to suggest to the University of Maryland Extension Service that we don't perform that ourselves, and I don't think many of the other nurseries do, because we try to give the same recommendations as they do at the University. I think most nurserymen do.

TOASTMASTER WITHGOTT: Maryland is very proud of her present Executive, but equally proud of some of her past Executives. One of the most important things in research work, whether for the canning industry, the fruit industry, or any industry, is that it must be given the most careful consideration and attention. Such companies as the American Can Company, Continental Can Company, Campbell's Soup, and many others spend as much as a million dollars a year in their research work. It is a pleasure tonight to call on Dr. A. F. Woods, Director, Scientific Research, U. S. Department of Agriculture, Washington, who will talk on "The Value of Research to the Fruit Grower." Dr. Woods.

DR. A. F. WOODS: Mr. Chairman, Ladies and Gentlemen: There has been so much said about research tonight by various speakers, that it seems almost unnecessary for me to add anything to what has been said. But perhaps just a little emphasis upon the larger aspects of the problem, and the realization of its importance not only in horticulture and agriculture, but to business generally, may not be out of place.

One of the first problems that I had presented to me when I went to the Department of Agriculture to try to aid in bringing a little more support to research, was a question brought up by the Committee on Appropriations. Seven years ago when I first appeared before that Committee and tried to advocate the importance of research in agriculture, I was met with this proposition: "Well, you people are

getting a lot of money. It amounts to something like eight million dollars a year for research. You have been at it now for forty years, and every year you come back here and ask for more money for research. Have you ever gotten any results, and what are the results worth?"

I said, "You have asked pretty hard questions. I don't think I ought to try to answer them without some facts. I would like a year to get those facts. In the meantime, give me enough money to see that the various bureaus who are carrying on this research can carry it on effectively, and I will tell you what it is worth."

They agreed to that. With the assistance of Mr. Woodbury and a committee of about 25 men representing various organizations affiliated with agriculture, we made a fairly good showing that first year. We got out some statistics which showed that industries aside from agriculture, were spending $180,000,000 a year for fundamental research for the promotion of their industries, and agriculture was spending approximately $8,000,000,000 for a sixty billion dollar group of industries. That seemed to impress them, and we were able to prove to them that those were facts.

I went back to the Department and called in the chiefs of the bureaus and said, "Gentlemen, if we are going to get any more money or keep the money we have, we have got to be able to give a reason for what we are doing. We have got to be able to give an account of what we have done. What I would like to have you do is to go through your project records for twenty years and pick out all the research projects and give me a summary. I don't want you to skip any of them. I want to know what you spent the money for, and what results you got, if it was nothing more than a minus."

So they went to work. We have a very good system of records down there, and they brought me in about three months a pile of briefs a foot high of the projects for twenty years. I asked them in getting that material together to give me not only the name of the project, the date that it

was started, the amount of money that it was started with, and the annual appropriation, but the publications that had been issued, and if there was any measurable money value, any way of determining money value, to give me that, and give me the basis on which they determined the money value, so that I might present all the facts to the bureau of the budget, to go before the president of the Committee on Appropriation, and to the Secretary of Agriculture.

I found that something like eight or nine million dollars had been expended, but the annual returns from the projects for which there was a measurable value showed that for each dollar expended for research, there was an annual return of $500, in measurable value, and I had the facts to prove it.

As an illustration, let me give you one example. Take the citrus fruits. There was a great industry in which millions of dollars, over $100,000,000 was invested in California alone, and 26 per cent of all the fruit that was shipped from California rotted before it reached the terminals in the east.

So we started to work on every aspect of it. One man discovered that if a citrus fruit was scratched, the tiniest scratch, the blue mold would get into it and rot it. If the skin was not scratched, kept intact, the mold wouldn't get in. If you carefully picked the citrus fruit, graded and packed it so there were no scratches on the skin, you could ship it to New York without any ice and none of it would rot except perhaps one or two. The average per cent was two per cent that rotted in transit without any refrigeration at all.

Just that little observation changed the whole system of picking. The clippers were smoothed and rounded off, all the nail heads in the grading chutes were padded, the boxes were fixed so that when the fruit was put in there no splinters would stick out and scratch the fruit. No one was allowed to drop a fruit, he had to lay it down. Every means was taken to prevent scratching.

The very first year that that was published, the books of one concern in Los Angeles alone who co-operated, showed a million dollars net saving as the result of that particular experiment. That is just one of thousands of examples.

If there is anything that yields a better return than research, a better return than getting the facts that underlie every phase of your business, I don't know what it is. Every business organization that is today competing successfully in the market is basing its operation upon facts that are gathered by research men who get the facts, and apply them.

Now, we are not claiming that this Experiment Station and the Department of Agriculture are the only agents that are conducting research. It is going on everywhere. Every fruit grower is a research man if he is a really practical man. They are always studying, always observing. Then we put our heads together in organizations like this and see what we can do with that information.

During the last five years, and especially during the last two years, the biggest and best organized concerns in the country are not putting less money into research, but they are putting more. The experience of business everywhere is that research pays.

As Dr. Patterson said, we don't use one science, we use all of the sciences, every one of them, including psychology, which isn't a science, but we use it just the same, because we have to know the psychology of the people we deal with.

We have to study art, because art today is entering into every phase of business. Horticulture is the greatest of all promoters of art. These flowers, everlasting emblems of beauty, are things of art. Those who grow them are just as much artists as the men who paint a picture or carve a beautiful statue.

So I want to say, the great Department of Agriculture which is the center of this great research mechanism which includes all the experiment stations, and which altogether now with the help of these men who have helped us to get

more money for research, we have increased it now over five million dollars since this program was started, and we now have nearly twenty million dollars for research in the Department.

All that money is going into very carefully outlined projects, with a view to finding out some important facts that some group or some individual needs to know for the welfare of his business. This great organization that we represent, this university and the Department representatives —its birth is due to such societies as this horticultural society. We grew out of the efforts of the early horticultural societies of this country to have science applied to agriculture. These land grant colleges grew out of their efforts to have science applied to learning that underlies agriculture, that men engaged in industry might have the same kind of education that the doctors and lawyers used to have entirely to themselves. Now everybody has it, and we find great enjoyment in life, and great profit in life because we have it. But it is due to the efforts of those men 200 years ago in getting together with George Washington, Thomas Jefferson and all the other great men of that time, and saying, "We need science, we need all the information, all the knowledge we can get applied to agriculture, applied to horticulture," and they started the movement which has fruited in this great organization, that spends all together, for all purposes for the promotion of this great sixty billion dollar industry about perhaps $150,000,000 a year, and which gets, as I say, results through the experiment stations and the Department and the co-operating of thousands of co-operators everywhere, results that for twenty years measured from 1926, twenty years back with $500 a year for every dollar expended, or 50,000 per cent a year on the investment.

TOASTMASTER WITHGOTT: Dr. Woods, we thank you for that very interesting talk. It is a pleasure to call on Dr. Symons, director of Extension of the University of Maryland, who will talk on "The Development and Importance of Maryland Horticulture." Dr. Symons.

DR. T. B. SYMONS: Mr. Toastmaster and Friends: We are approaching a period, friends, in the horticultural world when some times we fail, perhaps to appreciate the accomplishments of this generation. I am supposed to discuss the importance and development of horticulture from the time when trees were planted and allowed to grow and just bear fruit if they would, or stand there if not. And when we think of the days of the nineties when there were six million trees in Maryland planted promiscuously over the whole State, but particularly when the Eastern Shore was a peach orchard, and then consider the state of the industry at the present time, I am reminded of the story of the old farmer as illustrating trusting to the Lord for all good things. This last fall he had a crop of potatoes in the ground, and his neighbors were very much worried as to why he would not dig them out for fear of frost.

One of them approached him and said, "John, when are you going to dig up your potatoes?"

He said, "I am not worried about that. I trust to the Lord."

The neighbor said, "You don't suppose you are going to have your potatoes dug for you, do you?"

"Oh, no, I don't know. I will tell you. When I wanted a ditch last year, a flood came along and cut a ditch right through my field. That suited me just right. I wanted some kindling wood. An electric storm hit my place and struck a tree and gave me a fine lot of kindling wood. Now I am waiting for an earthquake to shake my potatoes out!"

So the horticultural industry from the fruit standpoint can be classified almost into those days when the trees were planted promiscuously, and then when we reached a period of insects and diseases, which was a very distinct epoch in the development of horticulture in the State. Then we proceed to the period where competition has affected the industry, as well as to a third period that comes from the passing of the pioneer. We are dedicating a wonderful horticultural building. We are appreciative of the efforts

of all that have been mentioned, but let's stop, perhaps for a moment, and render a humble eulogy to those who have passed, as well as some who are still with us, who, perhaps built the first cornerstone, and at least have contributed many bricks to this horticultural building.

I would like to say in passing that to enumerate the men of the past who have developed the industry in the state is something that I approach with considerable reluctance. But I trust you will pardon me if I should forget to mention some of the most worthy representatives of the industry, that to my mind, planted the first seed that developed and bloomed as a rose in the industry of the State.

How many can I mention tonight in the dedication of this new building? Shall I go back to the formation of this Society in 1898 when a few fruit growers met in Baltimore in Pacific Hall on January 26 and 27, just 34 years ago this month, for the realization, the purpose of forming some organization in the State of Maryland to develop the horticultural industry? And so we have the first committee composed of Howard Davis, of Franklin Davis Nursery Company; Samuel B. Loose, of Washington County; Orlando Harrison, of Berlin; Robert S. Emory, of Chestertown, as the first organization committee that was formed for the purpose of forming the State Horticultural Society.

They had two committees, one on legislative procedure, and one for the organization of the society. The legislative committee, headed by Mr. Biggs, was the cause of the enactment of the State Horticultural Law, which brought about the first appropriation of eight thousand dollars for the development of the horticultural work in the State.

The other committee, the organization committee, headed by Mr. Davis, formed the first permanent organization of our State society. Then the annual meeting of the society was held in December, on the 4th and 5th, 1898, the first annual meeting of the fruit growers as well as the florists and vegetable growers of the State.

I can only mention that Charles G. Biggs was the first

president, a man most capable in his interest in horticulture, in his interest in legislation, and perhaps was most active in getting the legislation for the horticultural department as well as incorporating our society. Then in passing down, I have listed George Balderson, whose son is here. We have Emory Pry, who planted the mountains of Washington County outside of Hagerstown, and was a leader in that community. We had Billy Hughes; we had J. P. Blessing. I have never known a man so devoted to the work of the State, so interested in horticulture as Orlando Harrison, who was a charter member of this organization.

And now I am going to call upon a man, perhaps the oldest member of the society, a man who was with us when it was started. This man is Mr. A. L. Towson, and I am going to ask him to rise.

I will mention Dr. Lowndes, and Captain Emory. On his place was the first experiment conducted for controlling the San Jose Scale by placing a tent around the trees. Professor Johnson had his place covered with experiments in the early days of trying to control the scale with hydrocyanic acid gas.

Shall we mention James S. Harris, who introduced pears as well as peaches to the Eastern Shore. I mention E. P. Cohill, of Western Maryland, who is represented by his three sons in the fruit industry, a man who had the vision to plant the mountainside, the man who could see the results of efforts in the planting of good apples and good varieties in that land that Dr. Patterson said was only bringing 50 cents an acre in taxation. Today it is a most marvelous sight, a beautiful orchard planted on a mountain side that couldn't be better in any country devoted to horticulture.

I have here listed a dozen others that I can't fail to mention: W. F. Allen, of the Eastern Shore. He planted peaches years and years ago. I wish I could say a word about J. W. Kerr. He was an outstanding man in horticulture in this nation in his time. On his place on the Eastern

Shore he had the greatest plum orchards of this country. He was the man who introduced the Stayman Winesap apple to the State of Maryland, and as we know now, the Stayman Winesap probably ranks third in the number of trees. He was a man of unusual ability, and one of the pioneers in the fruit industry of Maryland.

I am going to close by showing you a couple of charts that will convey to you an idea of this industry. You will note that the truck crops represent 23 per cent of the industry, canning crops represent 17.8 per cent, potatoes represent 23.2 per cent, sweet potatoes 5.2 per cent, home gardens 11 per cent.

The nursery and floriculture interests amount to 4.7, small fruits 10.7, and orchard fruits 13.3 per cent. The total industry in 1929 represented $28,247,000. That is the total farm value of these crops. That is illustrative of the consideration that the research people and the extension folks and the members of this society should give to the respective industries covered usually in horticulture in this State.

I thought it would be interesting if we could illustrate what has happened in the past thirty years to this industry, since the formation of this society in 1898. Let me say that this is progress in the respective value during the past twenty years, and that is prepared on the basis of a dollar in today's value instead of 1909 or 1910. In other words, you know that a dollar in 1910 would be worth $1.69 today, so that the values of 1910 were multiplied by $1.65, and then the comparison has been made in today's dollars so it would be a fair and just comparison.

This is what happened in truck crops. It was worth $9,000,000 in 1910; in 1930 it is worth $11,500,000. Canning crops in 1910 were worth about $3,500,000; in 1930 they are worth $5,000,000. Orchard fruits in 1910 were worth $2,500,000, and in 1930 it has gone up to nearly $4,000,000. The same is true with the small fruits. In 1910 the crop was worth about $2,000,000 and it has advanced to $3,000,-

000. In sweet potatoes in 1910 we had a value of about $1,000,000, and now in 1930, $1,500,000. Nursery and floriculture in 1910 was valued at $1,500,000, and now at $2,000,000. Let me explain that the figures in nursery and floriculture are very inadequate from every source, and while this is as nearly accurate as we could make it from all the figures available, I am sure if there is any discrepancy there has been a larger development in the floriculture than in any other phase of horticulture.

In 1910 the home garden was represented at $5,000,000, and today the home garden value has decreased to $3,000,000. There may be a discrepancy there with the census figures as well as the estimates, but it is entirely possible that home gardens have decreased in value.

That gives you an illustration of what has developed in the industry during the past thirty years, the splendid efforts of the pioneers as well as those that are now guiding the work. I have listed here a few of the men who are now leaders. None of you folks realize the extent that Dr. Patterson has devoted and given his time to the industry as a whole. He has always stood for the development of the horticultural industry. We have felt years ago that Maryland was dedicated to producing crops for human consumption, and its future destiny will be marked by the development of horticulture, dairying, etc.

I therefore, have no hesitancy in feeling and hoping for the future of horticulture in Maryland.

It is necessary also, to mention Captain Sylvester, our old president. I also must mention Dr. Woods, who is always responsive, and our present executive, a man who is devoted to developing the industry in the State. Many of you here present remember Jimmy Robinson. Jimmy Robinson started the fruit growing in Montgomery and Harford counties. I can't pass the whole row, but we had Professor Robinson, Professor Sansten, Professor Austin, and Professor Close. Then we had the coming of Dr. Auchter in 1918.

But with Auchter and his associates, with entomologists and pathologists, starting out with Johnson and Gould and Quintance, and then with R. I. Smith, and now with Cory, we have a galaxy of men who have worked in entomology who have contributed bricks to this building. We have our pathologist, Professor Norton, who is still with us, as well as Mr. Temple, Mr. White and many others. We have Mr. Shaw, who was the first assistant horticulturist, and who developed into this inspection work that has contributed much to the pack and quality of our fruit.

I cannot close without mentioning what Richard Vincent has contributed to the State; who popularized the dahlia, geranium, and who nationalized the dahlia for Maryland as well as this country at large. I can only ask your apology for not mentioning many other deserving men who have contributed bricks to this building, whose memory will be lasting in the future development of the industry, whose work will be an inspiration to every one, and the young people who will follow in making the industry for Maryland a greater one. May the mystic cords of memory stretching from a hundred battlefields stir the angels of our better natures, co-operate more closely in developing this great industry for the good of all.

TOASTMASTER WITHGOTT: I want to pause for a moment and pay a just tribute of honor which I feel is very deserving, to the president of this society, who has worked so earnestly and so energetically during the past years, Mr. G. S. L. Carpenter.

The State of Maryland drafted a gentleman, a scholar, a statesman from Iowa, who has come here and helped to develop this institution of which the entire State is justly proud. We have watched its growth, and we are all sure that under the present president it will continue to grow. It is indeed, Dr. Pearson, a pleasure to call upon you as president of this University. Dr. Pearson's subject is "The Importance of Thorough Training in the Development of a Successful Horticultural Industry." Dr. Pearson.

DR. RAYMOND A. PEARSON: Mr. Toastmaster, Mr. Carpenter, ladies and gentlemen: There are a number of others who ought to have been heard tonight, but we have come to the close, and I imagine that every one of you at this moment might be compared with an Australian bird I heard of a few days ago, a bird that always flies backwards. It is called the Doozer bird. The reason it flies backwards is because it doesn't care where it is going, but it wants to see where it has been.

We are highly honored by your presence tonight. We are getting in something of a habit here, of dedicating buildings. About three weeks ago we dedicated two; the women's dormitory and the women's field house. Tonight we dedicate this splendid horticultural building. On the 20th of this month we shall dedicate the men's field house, and just a little later, the addition to the engineering building, and all that besides a new library and a new power plant which have been put in use this year. We don't do that every year. What we are doing now is the result of a long period of waiting, but during the present year the University of Maryland has made tremendous advances in its physical equipment, and we look upon this building as one of the very important ones of the new group. We do most sincerely appreciate the action of our Governor, the action of our Senators who are here, and their colleagues, and the members of the House of Delegates, and we appreciate what so many of you have done.

I want to tell you that when the State Horticultural Society gets busy, you had better stand aside. I well remember some little time ago they had been meeting and passing resolutions. Finally they called me into a conference up in the Rennert Hotel, and they closed the door and somebody locked it I believe, and they proceeded to tell me exactly what they were going to do and what they wanted me to do. A little later I was getting my wind and trying to catch on to this great moving machine as well as I could, for I believed in them.

A little later I was invited to a luncheon. I think Mr. Carpenter was there, Senator Withgott was there, and Lee Allen was there, and some others. Anyway, how they did talk. They had it all fixed as to what they wanted. What do you think I did after that? I went home and went to bed and the next day I went to the hospital and I stayed in that hospital for two months.

We are very proud of their work. Senator Fooks was kind enough to refer to this building, and kind enough to refer to me as President Woods. About two people out of every three do that yet. I consider it a very high compliment, but I am beginning to get a little tired of it though! Every time I turn around they say, "Aren't you President Woods?" and then they look kind of disappointed.

I had been here but two weeks when I had a telephone call to hurry to Baltimore one day. So I jumped in my automobile and raced over this pike and went to the building where I was to go, and one of the janitors saw me standing there and he said, "Dr. Pearson, they are meeting right in here." He started to show me the room and then he said "You came up pretty fast, didn't you? How long did it take you, Dr. Pearson?"

I said, "I came up in 56 minutes."

"Is that so? Dr. Woods used to come up in 55!"

Now, we haven't paid all the bills. I have been watching these finances day by day. This is a $150,000 outfit when it is finished. It is a large amount of money, isn't it? Isn't it big, and a wonderful thing it will do. Why folks, do you know that all the money in this building represents only one-half of one per cent of the value of the horticultural products in one year in the State of Maryland? And the horticulturists didn't pay for the building at that. Much more than half of it was paid for by the people of Baltimore. Under our system of government we all share in these expenses that are important to everybody. The horticulturists are taking their turn, evening things up by helping out with other things of importance in this State that are not directly in the line of horticulture.

What does this building cost the people in Baltimore? Let me tell you. Our State building money, I believe, is spread over a period of thirty years to be amortized, and this wonderful building is costing the average man, woman and child, black and white, in the State of Maryland, the large sum of one-third of a cent each for the next thirty years. Let's just keep that in mind. It is a tremendous thing. But it is not so big nor so costly that it is going to hurt anybody, we hope.

My subject, is the importance of thorough education for successful horticulture. That subject was very cleverly chosen.

Well, I will just tell you; speaking on behalf of the Board of Regents, the administrative officers of the University of Maryland, and particularly, the horticultural staff and all the employees, we recognize the necessity of thorough instruction in horticulture if we are going to have a successful horticultural industry, and we accept these facilities with grateful hearts. We have not been asleep at the switch during the years of waiting. With the facilities, poor as they were, we were still trying to get results. They might have been worse. We were not making bricks without straw. We had a good deal of material and a good deal of equipment, such as it was, but we have succeeded in developing a Department of Horticulture in this university that compares well, I believe, with any department of horticulture anywhere, and until just a few months ago we succeeded in holding as the head of that department the most outstanding teacher of horticulture in the United States.

Some of you, when you heard that he was going to leave us, came to me and showed in no mistaken way that you felt pretty badly about it, and I did, too. I don't believe he would have left for anything else except the position that came to him, which gives him the same intimate connection with every horticultural State and horticultural district in the United States that he has enjoyed so long in

the State of Maryland, and which we expect him to continue to maintain in this State of Maryland. But you will all agree with me, that we are mighty fortunate to have kept Dr. Auchter as long as we did.

Now, farm crops are food crops, and they are not produced without a struggle, and there are more enemies and harder fighters coming up every year than there were the year before, and we cannot produce good horticultural crops in 1932 with the knowledge that we used in 1931. In other words, we have to keep our research operations in motion, we have to keep our educational efforts up to the highest possible standard.

Therefore, this building is necessary; it is necessary for that purpose. This building has been provided by the people of the State and it belongs to the people of the State, and our Department of Horticulture are tenants. They have a life interest in this building, and it will be their highest purpose to return dividends to the owners of the building, and acting through and with our State Horticultural Society, the many men and women who are engaged in these activities throughout the State.

So, Mr. Toastmaster, tonight, solemnly and reverently, with high appreciation and high purpose, we dedicate this new horticultural building on the campus of the University of Maryland.

TOASTMASTER WITHGOTT: The meeting will stand adjourned.

The meeting adjourned at ten-fifteen o'clock.

WEDNESDAY MORNING

January 6, 1932

The Fourth Session, held in the Lord Baltimore Hotel, Baltimore, Maryland, convened at ten o'clock, Mr. Raymond Hanson, Vice-President, presiding as Chairman.

CHAIRMAN HANSON: The meeting will come to order. Our first speaker this morning is Dr. A. Lee Schrader, Pomologist, University of Maryland, and his subject is "The Effect of Nitrogen, Potassium and Phosphorus on the Keeping and Shipping Quality of Fruit." Dr. Schrader.

DR. A. LEE SHRADER: Mr. Chairman and Members of the Horticultural Society and Friends: We have become acquainted with the beneficial effect obtained from the use of nitrogen as measured in definite increases in yield and growth on our fruit trees. I am talking in terms of most of our orchards in Maryland. But this practice of using nitrogen, especially in large amounts, is rather recent. We look back in some older literature, and find references to complete fertilizers used on orchards. I remember particularly a survey of Berkeley county, West Virginia, made by Dr. Auchter in 1915, in which he states that the majority of the growers used a complete fertilizer. No mention was made at that time of nitrate of soda, ammonium sulphate, or other nitrogen fertilizers.

Hence, with the recent use of nitrogen, some interesting questions have come up, and among these has been the problem of the effect of nitrogen fertilizers on the keeping qualities of our various fruits, as well as the shipping qualities of various fruits. In fact, the matter has become so acute in certain instances, that buyers have discriminated against fruit which has been grown in orchards fertilized by nitrogen fertilizers.

With this problem presented to us a few years ago, we started in 1927 to make some extensive experiments to determine the effect of fertilizers, if any, on the shipping

and keeping qualities of apples, peaches, and strawberries, our three major fruits. We had in existence several fertilizer plots over the State on peaches, apples, and strawberries, and on the sandy soils if the Eastern Shore, extending through the clays around Frederick and on up to the shale soils of Western Maryland.

We obtained samples of fruit from the various plots and measured the keeping quality and shipping quality by actually determining the number of fruits that decayed during storage and particularly the rate of softening of the fruit during storage. We measured the rate of softening by determining the firmness of the fruit at various times during the storage period, which meant, of course, that with apples in cold storage we determined the firmness at monthly periods, and in the case of peaches held at ordinary temperatures we determined the firmness daily, or at two-day intervals. In the case of strawberries, it was very difficult to determine the firmness by mechanical means.

The instrument which we used on apples has been used in the northwest on pears commercially, and also on apples, to determine the best time to pick to get the best storage quality. This instrument (Magness and Taylor pressure tester) gives you the number of pounds pressure required a plunger to penetrate into the apple flesh a certain distance.

When we put the York apple in storage, we usually have around twenty pounds pressure, or in other words, the firmness registered 20, and when the apple is taken out of storage along in March, it may have dropped to 10 or 12. In the case of peaches, we have another instrument called the Blake tester. This tester is on the same principle as the apple tester, only smaller.

In 1927 we selected some samples from our plots in Western Maryland, obtaining a barrel of fruits an inch and three-quarters to two inches, a barrel of two and a quarter to two and a half, and a barrel of two and three-quarters up from each plot. That made three barrels from each plot, in three different sizes.

Pressure testing during the storage season, as we call the method of determining firmness, showed no differences in firmness during the storage season until the end of the storage season, whether we had twenty pounds nitrate of soda applied per tree, or ten pounds of nitrate of soda applied per tree, or whether we had no nitrate of soda applied per tree.

In 1928 we extended our experiments to include several varieties, starting out with Williams over on the Eastern Shore, working through Stayman, York and Rome, both on the Eastern Shore and the Western Shore, and we continued those experiments through 1929, 1930 and 1931. We will continue the work for a few more years, but in each year we have found the same story. Regardless of the amounts of nitrogen, we have applied, regardless of the length of time we had been applying it prior to the sampling, we found no influence on the firmness of the fruit, or in other words, the shipping and keeping qualities of the fruit.

This agrees with work carried on in other States. Other States have been confronted with the same problems, and have done extensive work. In fact, in Ohio, Dr. Gourley has found that the nitrogen content of the fruit has been increased 100 per cent, that is, the nitrogen taken up from the soil has increased the nitrogen in the fruit itself 100 per cent over the check fruits, and still the keeping qualities and shipping qualities have not been impaired.

On peaches we started in 1928 with extensive work on the various plots over the State. On Belle of Georgia and Elberta peaches on the Eastern Shore and Elberta on the Western Shore, we found no influence on the rate of softening or the firmness at picking time, where we have applied nitrogen.

Working on strawberries, we made counts on the number of decayed fruits, the number of soft fruits from our samples, and there again we have found no difference as far as we can measure it from the various plots, nitrogen having

no effect except that we always have an increased size of berries, as a general rule, when we apply nitrogen to our strawberry beds.

In determining shipping quality, we compared the same size of berry, realizing, of course, that larger berries ship and keep more poorly than the smaller berries. Of course, the grower likes to have large berries. He is willing to sacrifice something in shipping and keeping quality to get a larger size berry.

With apples, we had another problem presented to us when we considered the more recent use of fall applications of nitrogen to apple trees. We have experiments over the state on the effect of fall applications on the growth and yield of apple trees, but have made no definite recommendations. However, we have obtained some very favorable results and based on those results some growers have been using fall applications of nitrogen, applied before the fruit is harvested, about September 1 or September 15.

Now, the question is, what effect will such applications have upon the crop then on the tree? Will we decrease the shipping quality and the keeping quality of such fruits then on the tree? That was the question put up to us, and it was a real practical question, since some of the growers have suffered financially because buyers stated that the keeping quality had been impaired by such applications.

The result of our studies in 1928 and 1929 are published in *Maryland Bulletin* 326 under the title of "Effect of Applications of Sodium Nitrate Upon the Color, Keeping Quality and Nitrogen Content of Apples." Here again, we have found that the nitrogen applications did not influence the firmness of the fruit, the number of decays, or breakdown, either in common and cold storage. In one experiment in 1929, the trees were in a poor condition, and after the nitrogen was applied you could actually see the greening of the leaves in the fall. When the leaves were analyzed chemically they showed a higher nitrogen content, showing that the material had been taken up by the tree within a com-

paratively short time, about two weeks. In spite of that intake of nitrogen by the tree, it had no influence on the shipping or keeping qualities of the fruit.

In 1928, on a more vigorous orchard, we had the same results on three varieties, York, Stayman, and Rome. We tried to find out also, if earlier applications than September would have an injurious effect. Applying nitrogen August 15 affected only one variety adversely, namely York. However, the applications in our commercial orchards have not been made as early as August 15.

In the title of this talk, you will notice that potassium and phorphorus are also under consideration. As you probably have heard several times, our experimental work in Maryland has shown no direct benefit from the use of potassium or phosphorus applied to our apple and peach trees as measured by growth and yield. An indirect return can be measured when the cover crop responds to applications of such materials and you turn down a heavier cover crop.

Considering these materials from the point of shipping and keeping quality, there is an old belief that potash increases color and shipping quality and keeping quality of apples. We also wanted to find out if potash had any influence; and in case nitrogen did have an influence, whether potash would correct such an influence.

So, in 1928 along with this other work, we did extensive work on four forms of potash, muriate of potash, sulphate of potash, sulphate of potash of magnesia, and a low grade potash called manure salts or kainit. We applied those materials to apple trees, as high as ten pounds of muriate per tree, or the equivalent of other salts, which, in the case of the low grade salts, meant as high as 25 pounds per tree. Other plots received half of that amount, and one-fourth of that amount. We obtained samples as in the case of nitrogen work, and measured the influence with a pressure tester. Again we found no influence on the firmness of the fruit, no influence on the shipping qualities of peaches, apples, and strawberries.

One source of potash, sulphate of potash magnesia, showed a measurable influence on the firmness of our apples, but that measurable influence was so small as to be of little commercial importance. It may be that over a long period of time we may have accumulative effects from the use of potash fertilizers.

These results on potash agree with some work on peaches and prunes in California. In fact, in California, the prune men were very strongly of the opinion that potash increased the sugar content of the prunes. But the experimental work out there showed that in spite of the fact that potash got into the fruit and increased the potash content of the fruit, there was no difference in sugar content over the fruit which had not received potash applications.

Some work has been done in England showing a very definite influence of potash on the keeping quality of apples. But in interpreting that data we must look to a certain definite injury to the trees from the lack of potash, called leaf scorch. Leaf-scorched trees, suffering from lack of potash, grow fruits which have poor keeping quality largely because of the leaf area being severely injured. Now, when we apply potash, we remove the "leaf-scorch" and the fruits are grown under normal conditions; hence the fruits keep better.

Summarizing, we have, to date, found no influence from potash salts either in combination with nitrogen or in combination with nitrogen and phorphorus, and complete fertilizer on the keeping or shipping qualities of fruit in Maryland. We did a certain amount of work on phosphorus, included with this other work, and we found no influence from the use of phosphorus.

Now, if we do not have any of these influences from fertilizers, why do we have the criticism? Why do the buyers discriminate? Are they just arbitrarily taking that attitude, or do they have any justification? They have a justification from one standpoint. When the man who uses nitrogen fails to recognize that nitrogen delays the maturity of

his fruit, and attempts to pick his fruit too early, he picks immature fruit, and such fruit is going to keep poorly. That is a condition that is up to the grower.

Nitrogen delays the maturity of the fruit. In the case of peaches, it may delay harvest a week to ten days. Apples may not be delayed quite as long as that, but you have all seen the fruits on apple trees without nitrogen coloring up more quickly, and as you look at them you say, "Well, they are more highly colored than the nitrogen fed fruits." The nitrogen fed fruits are simply slower as a general rule, except under conditions which I will point out later.

In the case of strawberries, some buyers may have a justifiable complaint when the grower has produced his strawberries with too much nitrogen and too heavy a foliage, with the result that we have a favorable place under the foliage for the development of field rots which do not develop until the berries are in transit. We want to have strawberry beds in a good growing condition, but not so dense but what they will dry off in the early morning hours and not have this unfavorable effect of field rots.

In the case of apples and peaches, growers may or may not find an increase in size due to nitrogen applications. If the tree is set very heavily, you may not have an increase in size. If they do not set so heavily, you will have an increase in size of fruit. Large sized fruits as a general rule being in demand in this domestic market, they are, of course, better from the growers standpoint, but when he has larger fruits they do not keep as well as smaller fruits.

If you want to talk without reference to the size of fruit, you might say that when the nitrogen increases size it decreases keeping qualities, but that is not a direct influence. When you compare apples of the same size from nitrogen trees and no nitrogen trees you have exactly the same keeping qualities.

When we have fruits that are poorly colored, we have a decreased keeping quality, and here again there is a word of caution to the man who uses nitrogen. If he grows his

trees with nitrogen and fails to keep those trees well pruned out he will get poorly colored fruit under the heavily shaded parts of the tree, particularly when he is bringing some of the old inside spurs into bearing that have never borne before.

I have in mind one plot of our experimental work in which the trees were fed with twenty pounds of nitrogen per tree. The grower had pruned those in the same way he pruned the trees that received much less nitrogen or no nitrogen. As a result, when picking time came with a heavy crop, he had about ten bushels of fruit left on the tree that he could not pick because of lack of color. That was the grower's fault for not keeping pace with the development of the tree following the use of nitrogen.

So from the standpoint of the effects of nitrogen influencing keeping qualities, we may have these indirect effects which are not the fault of the fertilizer, but the fault of the management, and the use of such fertilizers.

MR. TOWSON: Did the potash affect the color of apples?

DR. SHRADER: We had no observable influence there on the color. We couldn't detect any differences in the plots, and in the fruits that we picked in our samples.

QUESTION: What about the flavor when using excessive nitrate on peaches and apples?

DR. SHRADER: Well, I don't know how we judge flavor except by analyzing for the amount of sugars, acid, etc., in the fruit. As far as the amount of sugars were concerned, we found no difference in the amount of sugars in the fruit itself, and acidity was much in the same order.

QUESTION: We had the impression, maybe false, that where excessive nitrate was used on peaches we lost practically all peach flavor.

DR. SHRADER: You might have this effect, that when you use nitrogen and apply it to both apples and peaches, we have a very heavy set of fruit, much heavier than without

the nitrogen, and without proper thinning, the leaf area per fruit is too small to furnish those carbohydrates and other materials necessary for quality. Dr. Magness has pointed that out very clearly. If nitrogen does give you too many fruits for the leaf area on the tree and thinning is not done to reduce that number of fruits, you will have decreased quality. That is up to the management of the orhard, in using nitrogen and using thinning in proper amounts to get quality.

QUESTION: If applied in the early years will it affect the life of the tree, shorten or lengthen it in any way, that is, nitrogen applied over a period of years?

DR. SHRADER: As we all know, a tree will go through a period of youth and vigor and reach its bearing age. The actual fruiting of the tree has a devitalizing effect and it goes on to decline. If we use nitrogen together with pruning, we have an invigoration and we actually increase by several years the life of orchards.

MR. ENGLAR: I was wondering whether nitrate or lime either one would help those trees through the droughty seasons we have been having. What I have in mind is this. We have an orchard of old trees, 24 years old. If we dropped the nitrate for this season there is a possibility of those old trees passing out. If we continued the nitrate, is there any advantage in continuing life in those old trees through the drought without the water supply.

DR. SHRADER: We have a man here who has been studying water relations for a few years. I would like to call on Dr. Magness to give you an answer to that question.

DR. MAGNESS: Unfortunately, I cannot answer the question definitely. There is some indication that nitrate has helped the trees through the drought, especially in 1930. Of course, we hope we are not going to have such drought conditions next summer. I think it is true that during the periods of extremely dry weather, available nitrogen has

helped the trees. Whether it would save trees that were in such extreme condition, whether they would die otherwise or not, I am not prepared to say. But I believe some nitrogen applied in the spring before extremely dry weather comes is helpful.

MR. ENGLAR: How about lime? Would lime be helpful, or otherwise?

DR. MAGNESS: So far as we know, there would be no particular influence one way or the other with lime. I don't see how it could help or harm except as it might improve the texture of your soil a little bit and make it take up water a little bit more readily. That would be the only possibility there. In other words, cut down a little bit on your run off from heavy showers.

CHAIRMAN HANSON: We will now hear from Dr. F. P. Cullinan, Senior Pomologist, U. S. Department of Agriculture, Washington, D. C., on "The Effect of Different Methods of Soil Management on Tree Growth, and Fruit Yields." Dr. Cullinan.

DR. F. P. CULLINAN: Mr. Chairman and Members of the Maryland State Horticulture Society: I am not very familiar with your orchard practices in this part of the country. For the last fifteen years I have been studying the response of fruit trees under midwestern conditions. So today the message I bring to you with reference to the behavior of apple trees under different systems of soil management is based very largely upon work that has been conducted.

Nevertheless, I think in discussing our problems on the growth of trees under different soil management treatments, we can again come on common ground because, after all, the response of a tree in any particular environment is much the same for that environment. I think growers have now reached the point where they do not want to take sides—that they are straight cultivation men, or sod men, or straw mulch men. The thing that is uppermost in their minds is that they want to make the trees produce to their

maximum capacity in the particular environment in which they are grown. Our problem is to study that particular environment. We must do this because our orchards the country over are planted on a great variety of soils and conditions ranging through shale, gravel, sand, sandy loam, deep soil, shallow soil, deep subsoil, dry soil, etc., and therefore to take from another section of the country, or from another part of a State, an orchard soil management system and try to incorporate it in our own without studying the conditions in our own orchard is somewhat dangerous. We may have to use a combination of treatments to get the best results.

Before I go into the discussion of the response of trees which have been obtained under experimental conditions I want very briefly for a moment to put before you some of the factors as we see them which influence growth and production. When we are studying soil management we must always bear in mind the factors associated with growth and production, and they are not very different under conditions in the West from what they are here in Maryland. However, the way in which you manipulate the environment may be somewhat different from the way it may be done in another section of the country.

So, as a background to this discussion, I should like to have you think of three important factors. We may think of these factors as forming the sides of a triangle, any side of which is necessary in this interaction of getting growth and production.

One of the most important of these is nitrogen. I am not going to say anything about phosphorus or potash, and I don't mean to infer that other nutrients are not important in the growth of the tree. They are, but from what we know through experimental evidence and the response of trees, nitrogen may be an important limiting factor. Another side of the triangle is moisture. Those two factors, then, will represent our soil environment. The third side of the triangle which represents the top environment I am

going to designate as leaves. You might call it sunlight and leaves, or you might call it top growth, but it represents the top environment. Thus we have leaves, moisture, and nitrogen. Anything that we may do to bring about an interaction of those three factors is what we are doing in our soil management and pruning practices. Since this discussion deals with soil management practice, I am not going to talk about leaves today. However, we have to keep them in mind, for a soil management system will not alone insure fruit production.

About twenty years ago, experiments with which I am quite familiar were started by the Indiana Agricultural Experiment Station on a study of the effects of different systems of soil management on the growth and yield of apple trees of the Grimes variety. A series of plots was laid out in an orchard in southern Indiana, on a silty clay loam soil, rather typical of a large area of the orchard soil in that section of the State. It was a soil rather low in organic matter, a soil that puddled when wet, baked hard in dry weather, and had a rather tight subsoil.

There were laid out three main systems of soil management consisting of cultivation with cover crop, straw mulch and grass mulch. Straw was added as a mulch underneath the spread of the branches to trees in grass, starting with about sixty pounds of straw during the first few years and then increasing that amount each year as the trees grew older, keeping pace with the spread of the branches. In the system where the trees were planted in grass but not mulched with outside material, the grass was simply cut and allowed to fall back on the ground. A portion of that plot, however, had the grass raked up around the trees to form a mulch. Now, what were the results during the first five year period?

The trees in grass alone did very poorly. The trees in grass under straw mulch made very good growth, doing equally as well as the trees growing under cultivation. It was found in the first five-year period that in two of the five years, which were very dry years, the moisture in the

sod plots was very low during the growing season. On that particular soil the wilting point was around seven per cent, and in the summer months in two of the five years, under the sod plots, the moisture got down pretty near to seven per cent, while on the straw mulch plot and on the cultivated cover crop plot the moisture content was just about double that percentage during the dry summer months.

You might say moisture was the limiting factor. During the growing season, moisture was a limiting factor, but remember, these trees did not receive nitrogen fertilizer. It was also found that during the growing season nitrates were very low under the sod, while under cultivation and straw mulch, nitrates were found in considerably greater amounts.

During the next five years when the trees came into bearing, about the same results were obtained. The trees under cultivation and under straw mulch produced about the same amount of fruit and made very good growth. The trees under grass without nitrogen were very low in production and continued to make slow growth. At the end of the ten-year period we took a certain number of the trees that had been in cultivation and put them into grass. In two years from the time we seeded them down you could see a marked difference in the trees in those plots. Bear in mind that this grass was seeded up around the trunks of the trees and the entire area in the tree square was seeded down to grass. At the same time, we began to add dry grass and straw as mulch to some of the trees which had been in grass alone without a mulch cover. What were the results?

The trees which had been in cultivation without nitrogen began to go off color, and in two seasons immediately following the seeding of the grass they looked very bad. The foliage turned yellow early in August, and the leaves began to drop about a month before they did on the cultivated or straw mulch plots. The trees in grass to which mulch had been added began to make better growth and had darker green foliage. Here was a case where we had trees in cultivation, put in grass, and they started to go down. Here

were other trees that had been in grass, the grass cut and raked up about the trees, and in addition straw was added. These trees began to come up. We would suspect, then, that the grass was getting a large percentage of the nitrogen which should have gone to the trees and hence the slowing up in growth. Those trees which had been in grass but which had straw mulch added began to come up in growth, and we would suspect that this response was due to smothering out the grass which had been utilizing some of the nitrogen and soil moisture.

At the end of another five-year period, or when the trees were fifteen years of age, we decided to use nitrogen fertilizer on a certain portion of the grass and cultivated plots. Nitrogen fertilizer in the form of ammonium sulphate was added to a portion of the trees in straw mulch and to those in grass alone.

The response in a few years was very noticeable. The trees in grass to which the nitrogen had been added showed a very marked response to the use of nitrogen. Over the five-year period the trees under a good heavy straw mulch system on this type of soil produced about the same amount of fruit as the trees under the straw mulch to which nitrogen had been added. Bear in mind, the trees under the straw mulch had been under this system for a ten-year period. However, we observed that after the nitrogen had been added to the trees which had been in straw mulch there was a tremendous increase in number of fruits set over the straw mulch trees to which no nitrogen had been added. In the following year the set dropped down under the straw mulch trees which received the nitrogen. So over the five-year period the total production was about the same on fertilizer and non-fertilizer trees in straw mulch. We did not thin those trees which had received this application of nitrogen and which produced a heavy set, and those trees went into a biennial bearing condition. They produced heavily the year of the application of nitrogen, and the year following that they dropped back. We frequently get that result on Grimes trees which set heavily.

The trees that had been in grass, and to which nitrogen had been applied, showed the most marked increase in growth and yield.

To sum up the results of that experiment, nitrogen was an important limiting factor, and moisture and lack of nitrogen were factors limiting the growth of trees under grass.

What effect have these systems of soil management had on the root system of those trees? Some trees planted in between the main rows and which had been treated exactly like the permanent trees were dug up to study the effect of the soil treatment on the behavior of the root system. This is what we found.

Under cultivation the roots were considerably deeper than they were under grass or under straw mulch. We found them to a depth of three feet on that particular type of soil. Under the straw mulch the roots were very close to the surface of the soil; in fact, we found roots as large as ¼ to ½ inch in diameter growing on the surface of the soil underneath the mulch.

Moisture records over the period showed that moisture under straw mulch was quite uniform through the season, and these plots did not show marked fluctuations in wet and dry weather. While the effects of the dry weather would show up first in the moisture content under cultivation or sod, it would not show up as soon under the straw mulch. The soil under the mulch was in a fine physical condition and was never as low in moisture content as that of sod plots.

Temperature records during the season under soil management treatments showed fluctuations; that is, under cultivation the soil temperature rose more rapidly early in the spring than under straw mulch and showed a drop earlier in the fall. The straw mulch system had a tendency to equalize the temperature, and we did not observe marked diurnal fluctuations at any time during the season.

The difference in depth of the root system brings out a

fact which may explain what happened to those trees that had been in cultivation but which later were seeded to grass. The root system was considerably deeper in the soil under cultivation. As soon as the plots were seeded to grass and without adding any nitrogen, or even where we did add some later on, the grass obtained a large percentage of the nitrogen because the tree roots were lower down. On that block when we examined the trees we could see roots of trees which showed a tendency to come up closer to the surface under grass.

You might ask what would happen in a dry season to those trees under the straw mulch system where their root system was growing so close to the surface of the soil. I feel that under that very shallow rooting system if the mulch practice were discontinued, in very dry years like 1930 and perhaps 1931, we might see some influence of dry weather on the growth of the trees. Although a large percentage of the root system was close to the surface of the soil, so long as we maintained an adequate mulch during the fifteen-year period, we did not see any harmful effect in a dry season.

Summarizing the results we secured there, we found under grass alone, the trees did very poorly; when nitrogen was added to the trees in grass, or where they were given an adequate mulch, they did better. Under cultivation with cover crop where we added nitrogen to the trees we did not notice a very marked increase on that soil over the trees in cultivation without nitrogen.

Cultivation we know is one of the surest ways of burning out organic matter in the soil, but nevertheless it seems to be a part of a system which has proven very satisfactory, and although we know it burns out organic matter, our problem is to put more organic matter in there by using cover crops and by turning them under in the soil. On those plots which had been under this treatment for fifteen years, and where the amount of nitrogen in the soil was too low to support a good growth of cover crops, we did not

notice any harmful effect in the growth of those trees without applications of nitrogen. It seems evident that cultivation in itself was doing something for those trees which grass alone was not doing. We rather expected to see those trees under clean tillage go down in growth and production before they did. We thought there was a slight decline in the production record in about the fourteenth or fifteenth year of the trees under continuous cultivation without nitrogen.

The grower who has an orchard planted on the hillside and who cannot cultivate because of serious troubles from soil washing is more interested in sod treatment. Here cultivation is out of the question.

Where trees have been growing ten or fifteen years, it is difficult to grow organic matter under those trees at that age and it seems that one of the best ways to get the organic matter is to bring in some mulch. We found by adding fertilizer to the grass between the tree rows that we could double the amount of grass produced there, to be used for spreading under the trees. It doesn't have to be straw. We used straw because we could buy it by the bale and put on exact amounts under experimental conditions. We could measure the amount we applied each year. But I have seen very favorable results in orchards, where they have used alfalfa hay, shredded fodder and other forms of mulch, which have been hauled into the orchard. Two years ago Professor Gourley told you of the grass mulch system used in Ohio, and a great many growers there are following the grass mulch system with very satisfactory results. No grass grows under the area of the spread of the branches, so the trees probably get the maximum amount of nitrogen applied in the fertilizer. It may be that a legume sod can be established in orchards which cannot be cultivated.

We are interested in legume sods, and about eight years ago we laid out another set of experiments in which we included cultivation with cover crop, alfalfa sod, and blue grass sod. We knew that the trees would do very poorly

in grass, and obviously there was no use to grow those trees without an application of nitrogen. All trees were grown for two years under cultivation and then certain blocks of trees were put in alfalfa, blue grass sod, and others were continued under cultivation with cover crops.

The results obtained where we seeded grass under the trees were exactly the same as secured before. Where the plots were seeded to grass up close to the young trees we saw those trees start to slow up in growth. This was true even though the trees received three-fourths of a pound of ammonium sulphate scattered around the three-year-old trees. The trees in cultivation with cover crops forged ahead. What was true with the trees in blue grass was also true with the response of trees seeded to alfalfa. The growth was not equal to that made by trees in cultivation.

Three years after seeding to grass, the trees receiving annual applications of nitrogen began to come along and made about the same terminal growth as the trees in cultivation, but they had been dwarfed and stunted somewhat during the period of adjustment from cultivation to blue grass sod, and whether they ever will catch up to the trees in cultivation remains to be seen. The trees in alfalfa sod without nitrogen made a little better growth than the trees in the blue grass sod without nitrogen but were not as good as the trees under cultivation with cover crops.

We divided the area into plots and added nitrogen to some of the trees in cultivation, alfalfa, and blue grass, and left the other portion without nitrogen. The results obtained after applications of sulphate of ammonia had been made over a four-year period showed that trees in cultivation-cover crops without nitrogen were making as good growth as trees similarly treated but receiving nitrogen. However, the trees in alfalfa with nitrogen were better than the trees in alfalfa without nitrogen. When the trees in cultivation come into bearing it may be found that they will show a beneficial response in spur growth and fruit setting to applications of nitrate fertilizer.

While it appears that the leguminous alfalfa sod under the conditions of this experiment was better for the growth of trees than blue grass sod alone, the alfalfa does take up some moisture and nitrogen in its growth, and the effect has been that the trees have not been able to get the maximum amount of nitrogen they could utilize. Under conditions where a fairly heavy growth of alfalfa could be maintained for discing under in the spring, results might be different.

MR. TOWSON: Did you try sweet clover?

DR. CULLINAN: Unfortunately, we did not. We wish now we had, because we had difficulty in getting alfalfa to make a good stand. The result was that on our alfalfa plots, grass came in. Some of our growers have used sweet clover and have added that in connection with their cover crop system. In Kentucky, as you heard yesterday, many of the growers are very enthusiastic about lespedesa, a Korean clover which does very well on their soil.

MRS. HARRIS: How many times would you cut the sweet clover?

DR. CULLINAN: There doesn't seem to be any definite system for following the sweet clover treatment. Some people leave the sweet clover in and do not cut it but drag it down or disc it under in the fall. Some let it grow through the season and clip it once. One man in Illinois who grows the yellow sweet clover discs in the fall and allows the sweet clover to re-seed itself.

MRS. HARRIS: I don't want want to break up the ground. I have pears.

DR. AUCHTER: You had better let it grow up and re-seed itself. All you sweet clover people know you have got to clip in June and clip high. If you cut low it won't come back.

QUESTION: In a newly set orchard where you want to save on labor could you combine truck crops and straw

mulch system and have truck crops between and save on cultivation?

DR. CULLINAN: I don't see why that wouldn't be quite satisfactory. In fact, in some sections they grow inter crops such as cantaloupes, tomatoes and other vegetables between the trees.

QUESTION: How wide an area would you mulch?

DR CULLINAN: I would mulch out to the spread of the branches.

QUESTION: I am speaking now about an orchard set this fall.

DR. CULLINAN: About two and a half or three feet on either side of the trunk, making about a six-foot spread.

QUESTION: Would a mulch of sweet clover help?

DR. CULLINAN: I think it would be distinctly beneficial. It would contain more nitrogen. You don't expect a marked response from a straw mulch the first season, so far as any decay is concerned. It will act as a mulch, but straw decays very slowly and you have to add nitrogen to it. Alfalfa mulch or grass mulch would be better than straw in that respect. We used straw in our work because we knew the composition of it and the amount we were applying, but any satisfactory mulch will do.

MRS. HARRIS: Have you had any experience with a paper mulch?

DR. CULLINAN: No.

DR. MAGNESS: You mentioned that you got this great development immediately of roots under your straw mulch. Did you check to see whether you also had deep root development there? That is, whether they were all shallow roots up under the straw mulch?

DR. CULLINAN: Some of the roots under the straw mulch went as deep as they did under cultivation, but a larger

percentage of the roots under cultivation were at greater depths. I would say 95 per cent of the roots under straw mulch were within the first twelve inches.

QUESTION: In the straw mulch did you have much trouble with field mice?

DR. CULLINAN: You do run into the field mice problem, and it was very serious on our straw mulch plot. The only way we got around that was to use cinders around the tree. We dug out a space and put in a bushel of cinders. That ended our trouble with mice. It so happened the mice were boring in down at the roots.

CHAIRMAN HANSON: Our next subject is "Factors Influencing the Setting of Fruit," by Dr. F. S. Howlett, Pomologist, Ohio Experiment Station, Wooster, Ohio. Dr. Howlett.

FACTORS AFFECTING FRUIT SETTING

FREEMAN S. HOWLETT

Experiment Station, Wooster, Ohio

Practically all fruit growers are familiar with the list commonly given, of the various factors affecting the development of apple flowers into fruits. Each fruit grower has in one way or another come in contact with one or several of these factors in operation. He knows that the killing of the fruit buds during winter freezes or the injury of flowers or young fruits by frosts are not uncommon. He has observed that cold, wet, rainy weather during bloom is hardly conducive to large crops of fruit. He may have noted that large blocks of a single variety result in rather light setting. Finally, nearly every fruit grower appreciates the fact that the application of a nitrogen fertilizer in the spring is to encourage fruit setting. He is not unaware that good growth and fruitfulness go hand in hand.

FRUIT SETTING USUALLY DISCUSSED FROM A GENERAL VIEWPOINT

In the usual fruit-setting discussion, the various factors have been considered from a general, rather than from a

varietal, viewpoint. To be sure, varieties have been mentioned, yet the emphasis has been upon the factor influencing the set, and not upon the response of a particular variety to this particular factor. It has been generally assumed that all varieties respond to the same degree, as measured by the yield produced under conditions of low vigor, poor pollination or late spring frosts. This situation is not surprising when we consider that until only recently have we been placing the emphasis on the varietal response in other phases of commercial fruit growing. Who, for example, would expect to spray all apple varieties alike with equally favorable results, either in control of insects and diseases or in the finish of fruit? Who would think of harvesting all varieties of apples at the same time or applying the same tests of the proper time of picking to all varieties? We know that varieties do not respond alike to low humidity of the air-cooled storage. And although we do not speak a great deal about differences in the pruning and fertilizer treatment of varieties, who would care to deny that differences in varietal response do not exist and that eventually we will adopt our cultural program on a varietal, rather than a general viewpoint.

FRUIT SETTING DISCUSSED IN THIS PAPER FROM A VARIETAL VIEWPOINT

The discussion of fruit setting on a varietal viewpoint is necessary for several reasons. In the first place the various varieties respond differently to a particular fruit-setting factor. To be sure the difference in response is one of degree yet this does not minimize the importance of the varietal consideration. The evidence in support of this difference in varietal response has been gradually, but no less significantly increasing, and in this paper some of the evidence will be presented. In the second place we are compelled to turn to the varietal viewpoint because our primary fruit-setting problems have usually been of a varietal rather than a general nature. For example, some fruit

growers have noted that Arkansas (Black Twig) has been a light-bearing variety due largely to the failure of flowers to set. Others have observed the tendency of the J. H. Hale peach to set lightly or produce "buttons", and many have noted that fruit setting of Stayman and Delicious is more uncertain than of Jonathan and Rome Beauty. It is thus evident that the ultimate solution of the fruit setting problems of major importance lies in an understanding of the varietal response rather than in a general consideration of fruit-setting factors.

ABSCISSION PERIODS IN THE APPLE

Abscission, or dropping of flowers in the apple, is a natural process, but is conditioned both in its severity and time, by a number of factors. Shortly after petal fall (2-3 days) the abscission of flowers begins and continues for a period of two or three weeks. The first drop is at first comprised of individuals which are of the same size as the flowers before bloom exclusive of the petals, but at the end is made up of slightly enlarged fruits. Following this period there are usually three to seven days when no abscission occurs. Then there begins another period of dropping, lasting two to three weeks, commonly called the second or "June" drop, which is comprised of enlarged fruits. The fruits which are still growing rapidly and are set during the first part of the June drop, may be "drops" at the latter part. Thus there are, in general, two periods of abscission in many of our common apple varieties.

It has become evident that varieties differ in the proportion of the flowers which usually fall during these abscission periods. During the first drop certain varieties have a very high proportion of their flowers falling while others have a relatively low proportion falling. In the first class are Stayman, Delicious, Starking, Winesap, Rhode Island Greening, Tompkins King, Arkansas, Turley, Arkansas Black, Stamared and others of the Winesap and Delicious groups. In these varieties 80-85 per cent of the total flow-

ers of the tree fall during the first drop, having on the average one fruit to a cluster. The second drop is normally very light and negligible.

On the other hand, there are a number of varieties which have a relatively light drop of flowers and fruits during the first abscission period with a consequently normal heavier period of abscission during the June drop. Jonathan, Grimes, Rome, Northern Spy, York, Baldwin, Wealthy and Yellow Transparent are examples of this group. Such varieties commonly lose no more than 30-40 per cent of the flowers and fruits during the first drop, having 3-4 fruits to a cluster. During the second drop a considerable proportion of these may drop from trees low in vigor.

PROCESSES INVOLVED IN FRUIT DEVELOPMENT

No one can understand the problems involved in fruit setting unless he is cognizant of the processes concerned in fruit development. In our common deciduous fruit plants, seed development and fruiting are related. In apples, the seeds are necessary if fruits are to pass through the June drop without dropping. To be sure such seeds do not in all cases necessarily have to be capable of producing viable offspring. Yet fertilization—the union of the male and female sex cells—must have occurred in several of the seed bearing cavities and at least a number of embryo (seeds) must have developed, if the fruits are to continue to maturity. Others have commonly pointed out that the fruits falling in the June drop are those with a low seed content (2-3 seeds). The fruits with the greatest number of seeds remain without dropping. This fact indicates one of the means by which the fruit grower can decrease the dropping of fruits during the June drop—that is adequate provision for cross-pollination.

It is obvious that the necessity of fertilization and embryo development makes essential the carrying out of a number of other processes. In the first place, there must be pollination, and later it will be pointed out that there must be

cross-pollination. This means that there must be present effective cross-pollenizing varieties and agents for the transfer of the pollen. The weather conditions must be favorable for the germination of the pollen grains on the stigma of the flower and the growth of the pollen tubes down to the female sex cell. Finally, there must be present an adequate water and food supply for the young embryo and the developing fruit. The fruit grower makes possible by various provisions and practices the carrying out of such processes. Failure to make provision for all these processes, as well as can be done, will likely have similar results to neglecting the strengthening of all links in a chain. The next part of this paper will be a consideration of each link in this chain of fruit development.

VARIETIES AND INJURY BY FROSTS

Varietal Susceptibility

Our experiece in Ohio has indicated that the variety Delicious is probably the most susceptible, followed closely by Stayman, Arkansas, and Winesap. During the last five years, exclusive of 1931, these varieties have rather commonly come into bloom with a large proportion of the terminal flowers in their clusters killed by frosts, but full commercial crops have been obtained. Jonathan and Grimes are far less susceptible. Rome Beauty and Gallia Beauty have been much more dependable for many growers because of their late-blooming characteristic.

Time of Frosts

As mentioned above a considerable proportion of the flowers may have been killed by frosts occurring before bloom with not unfavorable effects whatsoever on the crops produced. In this connection it has been noted in our Station orchards at Wooster that 50 to 80 per cent. of the flowers may be killed without affecting the commercial crop of Stayman or Delicious. On Stayman it has

been found that the setting of the terminal flower of a cluster inhibits the setting of the lateral flowers. When the terminal is killed one or two laterals situated in the most favorable location in the cluster set fruit. Thus there has been accumulating evidence that as heavy a set will likely occur if the terminal flower is killed as if it were uninjured. It has furthermore been found that there is a rather severe competition for food and water between the flowers of a cluster previous to full bloom. The killing of a considerable proportion of these flowers will likely result in an increase in the percentage of the uninjured ones setting fruit. Therefore no fruit grower should be in despair in regard to frosts before bloom. With 90 per cent. of the flowers killed on Stayman or Winesap trees, a full crop may be produced, and even with 95 per cent. killed, half a crop has been observed. Following such frosts, care must be exercised that all provisions for effective cross-pollination are made and that the trees are in excellent vigor.

It has been observed that frosts occurring during full bloom and thereafter will likely have particularly severe results in reducing the crop of Stayman, Winesap, Delicious and Arkansas. The crop in these varieties will usually be reduced to a greater extent than those on Jonathan, Grimes, York, Rome and Yellow Transparent. A very severe frost may kill all the fruits of all varieties, but this does not commonly occur in after-bloom frosts. This greater reduction in the yields of Delicious, Stayman and the other members of the Winesap family is very likely due to the normally smaller set of these varieties as compared with that of Jonathan, Grimes, and Rome. The greater abscission of the former varieties during the first drop has been previously pointed out. Obviously, killing 50 per cent. of the fruits would more likely reduce the commercial crop in Stayman, which has set only one fruit to a cluster than in Jonathan, which has set three or four fruits to a cluster. After-bloom frosts, it can thus be seen, will usually be more serious with certain varieties than with others.

Minimizing the Effects of Frosts

The best single means today for minimizing the effects of frost is to plant late blooming varieties. Furthermore, the varieties most tender should only be planted on the highest, frost-free sites. This applies to Delicious, Starking, Richared, Turley, Stamared, Blaxtayman, and all others of marked susceptibility to frost. This point has been overlooked in many plantings of these varieties.

As has already been pointed out, frosts before bloom may not reduce the yields of these varieties if the uninjured flowers are effectively cross-pollinated and the trees are making very good growth. These essentials should not be neglected even if 90 per cent of the flowers are killed. Six to 8 per cent of the flowers setting fruit will give a full commercial yield on a tree flowering at least moderately. No fruit grower is doing his best for adequate fruit-setting who does not provide for thorough cross-pollination and good tree-vigor.

VARIETIES AND CROSS-POLLINATION

It has been previously pointed out that the necessity of fertilization requires pollination as one of the steps in fruit setting. The question arises as to the efficiency of self- or cross- pollination. Below are given the results of our pollination work in Ohio and the interpretation drawn from the experiments carried on from 1923 to 1931 inclusive.

We have come to the conclusion, using three methods of attack, that all apple varieties require cross-pollination for full commercial crops. However, our work indicates that apple varieties differ in the degree of fruitfulness when self-pollinated. Some consistently produce more fruits than others when selfed. As a result of the work we have roughly divided the varieties into three groups, based on differences in the number of fruits resulting from self-pollination. This grouping is given because we believe it has some practical value to the fruit grower. In the first place there appears to be several varieties which produce practically no fruits when selfed (Group I).

GROUP I

Delicious	Blaxtayman
Starking	Stamared
Richared	Arkansas (Black Twigg)
Winesap	Rhode Is. Greening
Stayman	Arkansas (Black Twig)
Turley	

There is a second group of varieties which produce a small percentage of fruits when selfed (Group II).

GROUP II

Jonathan	Wealthy
Grimes	Northern Spy
Winter Banana	Yellow Transparent
Oldenburg	

Finally, there is a group of varieties (Group III) which will produce half a crop when self-pollinated. We have obtained no evidence whatsoever that these varieties will give full commercial crops when left entirely to self-pollination.

GROUP III

Rome Beauty	Red Rome
Gallia Beauty	Baldwin

Practical importance of this grouping

It should be clearly understood that the evidence indicates that all of these varieties require cross-pollination for full commercial crops. It is obvious that under conditions where cross-pollination is inadequate, certain varieties (Group III) will produce more fruits than others (Group I). An insufficient number of pollenizing agents in a Rome or Baldwin planting will not have as disastrous results as in a Stayman or Delicious planting (also all varieties in Group I). Bees, then, must be present in considerable numbers in a planting of the latter varieties, if a full crop is to be produced. One hive (15,000-25,000 bees)

per acre in mature trees of these varieties will likely be desirable, particularly in those plantings where the pollenizing varieties are none too close.

The difference in the proportion of fruits from selfed flowers also is a factor in determining the maximum distance of varieties from their pollinizers. It is obvious that Stayman and Delicious (as well as all varieties in Group I) will have their commercial crops reduced to a greater extent than the varieties in Group II and III if the pollenizing varieties are somewhat beyond the desired distance. For example, Stayman will show a greater reduction in yield if the pollenizing variety such as Jonathan is six rows distant than would Rome Beauty.

Thus in Ohio we are recommending that in new plantings, as well as top-worked plantings, no tree of any of the varieties in Group I shall be greater than two tree rows (70-100 feet) from its pollenizing variety. This, it will be observed, allows for four rows of Stayman together, if pollenizers are present on each side. In the case of varieties in Groups II and III it seems that trees may be planted three or four rows (up to 200 feet) from the pollenizing variety. These suggested distances are based on the requirement that Stayman and Delicious and all varieties of Group I require exceptionally effective cross-pollination if full commercial crops are to be produced. Furthermore, in these suggestions for distance of pollenizers, it is assumed that pollenizing agents are being introduced into the plantings.

When bouquets of flowers are introduced as a temporary means of cross-pollination, particular attention should be given, in their distribution, to the varieties which give the greater difficulties in fruit setting.

Varieties suitable as pollinizers

Since all varieties require cross-pollination, the question arises as to the varieties suitable as pollinizers. Obviously, if we wish pollen-tube growth, the pollinizing variety must

produce good pollen tubes; in other words, germinable pollen. Varieties which produce no pollen tubes, or which produce pollen tubes which are short and thick, soon bursting are:

Arkansas	Rhode Is. Greening
Baldwin	Stamared
Blaxtayman	Stayman
Gravenstein	Turley
Minkler	Tompkins King
Ohio Nonpareil	Winesap

Some varieties with fertile, germinable pollen are:

Ben Davis	Richared
Delicious	Starking
Golden Delicious	Wealthy
Grimes	Yellow Transparent
Jonathan	York Imperial
Oldenburg	

It has been previously pointed out that the growth of pollen tubes will not produce fruit, if union of the male and female elements does not occur, i. e. fertilization. We have been working for several years in Ohio upon the question of the effectiveness of Rome Beauty in producing fruit when used as a pollenizer of Gallia Beauty, and vice versa. Attention has also been given to the effectiveness of Starking on Delicious. The results to date indicate that Rome Beauty, Gallia Beauty, and Delicious produce no more fruits when crossed with their very closely related bud sports and seedlings than when selfed. In fact, we have on the basis of the evidence now available in this country, concluded that the combinations of varieties very closely related, and differing largely in color of fruit, such as Delicious with its bud sports, will be unfruitful.

It has been shown by your station sometime ago that Arkansas is not fruitful when Grimes is its pollenizer. Outside of this combination, and those mentioned above, I know of no cases among apple varieties where a variety

with good pollen is ineffective on another when the blooming seasons overlap. To be sure, it is occasionally stated that there are consistent and significant differences in the value of the good pollenizers upon some variety. To my mind, our methods of cross-pollination are not sufficiently refined, as yet, to justify such conclusions from the data given.

Temperature in relation to pollination and pollen-tube growth

Low temperature influences bee activity, pollen germination, and pollen-tube growth. It is likely that under practical conditions, low temperature has a greater effect in reducing bee activity than in preventing pollen germination and tube growth. The most common pollenizing agents, honey bees, are not sufficiently active below 60° F. to be very effective. On the other hand, the pollen grains germinate abundantly at 59° F. and below, while tube growth is also satisfactory below that temperature. There is appreciable growth of the pollen tubes between 50 and 55° F. Furthermore, it appears that at a temperature below the optimum for bee activity, the female sex-elements will remain in a condition capable of being fertilized for a fairly long time. Rather cold weather should not be charged with the blame of poor fruit setting if pollinizing agents and varieties are not available both before and after such a period of low temperature. Some fruit growers charge to low temperature (above the frost point) what should be charged to inadequate provision for cross-pollination during those hours when the temperature is favorable.

IRREGULARITIES IN THE DEVELOPMENT OF THE FEMALE SEX CELLS

For a proper understanding of the importance of the factors affecting the fruit-setting of certain varieties, we must give some attention to a characteristic of these varie-

ties which, up to the present, has been given little consideration. For some time, as pointed out earlier in this paper, it has been known that a number of apple varieties produce poor pollen; that is, the male sex elements are not functioning properly. However, the possibility that the female sex elements in certain varieties may not always function properly has been mentioned but the extent and importance of such irregularities has not been demonstrated. Lately we have been studying the importance of this factor in the setting of fruit and have concluded that it is an important one in certain varieties. These irregularities when occurring in the development of the female sex cells of a variety lead to the failure of fertilization in some cases and to the development of weak, unstable embryos (seeds) in others. The natural result of this is the normal heavy falling of flowers and young fruits during the first drop immediately following petal fall.

The varieties which normally have a considerable amount of such irregularities are Stayman, Winesap, Arkansas (Black Twig), Rhode Island Greening, and Tompkins King. It is very likely that Turley, Stamared, Blaxtayman, Nero, and Minkler also have this inherent characteristic. It is to be noted that these varieties give practically no fruits when self-pollinated (Group I) and are also those which usually are more likely to give us trouble in fruit-setting. These varieties then may be termed the "lighter-setting" varieties. The presence of this inherent characteristic means that conditions for fruit-setting must be kept particularly favorable. Cross-pollination must be very effective in order that the flowers which can set fruit, if cross-pollinated, have effective pollen transferred to them. The trees of these varieties must be kept vigorous in order to insure an adequate food and water supply to flowers with functioning sex elements. Furthermore, it is to be recalled that fruits can be produced with a smaller seed content if the flowering spurs are making very good growth. The maintenance of good growth and vigor compensates in part for such difficulties in the development of seeds and allows for the pro-

duction of full commercial crops, provided the flowers are effectively cross-pollinated.

The variety Delicious, acts, as far as its fruit setting is concerned, as if it possessed similar irregularities in seed development. At present, the primary reason for its behavior as a "lighter-setting" variety cannot be given. However, it has been demonstrated by experiment that one of the primary factors is competition for food and water between the flowers and fruits of a cluster. The fruit grower, by maintaining very good growth and vigor in this variety and its bud sports, is alleviating such competition and is doing what is necessary for satisfactory fruit-setting in these varieties. All cultural practices which bring about and maintain a good supply of water, nitrogen and carbohydrates to the developing flowers and young fruits are important in satisfactory fruit-setting. Particularly is this true with those varieties which have been termed the "lighter-setting" varieties

CULTURAL PRACTICES IN RELATION TO FRUIT SETTING

The problem arises as to the proper correlation of pruning, nitrogen fertilization, and the soil management system so that the food and water supply to the flowers and fruits is as adequate as we can possibly make it, under our particular eastern conditions. No attempt is made here to discuss these practices other than as they relate particularly to fruit-setting.

Nitrogen fertilization

Everyone is familiar with the recommendation that nitrogen fertilizers be applied before bloom to encourage satisfactory fruit-setting. From our present evidence it appears that this time of application is particularly important with those varieties which have been termed the "lighter-setting" ones. Unsatisfactory fruit-setting in Stayman or Delicious may follow if the nitrogen fertilizer has not been applied sufficiently early to insure its availability to the flowers by

full bloom. It also seems almost needless to state that no fruit grower who fails to apply nitrogen fertilizer to trees of these lighter-setting varieties, where nitrogen is likely to be the principal limiting factor in the soil, has reason to complain of unsatisfactory fruit-setting.

Pruning

It is commonly believed that pruning in addition to bringing about a greater nitrogen supply to the flowering points is of particular importance in increasing the water supply. It is on this latter point that I personally believe its importance exceeds that of nitrogen in aiding fruit setting. Water is undoubtedly of great importance in aiding competing flowers and fruits in maintaining themselves without dropping. It is probable that in the East, water is limited a part of the time during the flowering and fruit-setting period in practically all orchards. From what has already been stated it can be seen that an inadequate water supply would be particularly harmful in its effects upon the fruit-setting of such varieties as Stayman, Winesap and Delicious. Pruning, then, would be expected to have a particularly desirable result in encouraging and maintaining satisfactory fruit-setting in these lighter-setting varieties. The writer does not mean to infer that the pruning need be heavy nor necessarily annual. It does appear to the writer, however, that all has not been done for the production of full crops in these varieties which are giving us trouble in fruit-setting, if pruning is not a regular orchard practice.

Soil management system

No attempt is made here to discuss the effect of the various soil-management systems upon the set of fruit. The importance of maintaining a large amount of organic matter in the soil has been pointed out by other speakers. Moreover, the unfavorable effect of poor drainage, winter injury, faulty cultivation, and too close planting have been very well discussed by Dr. Heinicke in a recent paper before

this society. All factors which decrease the water, nitrogen, and carbohydrate supply to the flowers and partially developing fruits will reduce the set of fruit. No fruit grower has done all he can possibly do to maintain satisfactory fruit setting who has not provided the proper conditions for the supplying of these materials to these organs.

CONCLUSION

The emphasis in this paper has been placed upon the varietal viewpoint in fruit-setting. Through an understanding of the behavior of each variety, the fruit grower is in a much better position to bring about and maintain the setting of full crops.

CHAIRMAN HANSON: Are there any questions? We will at this time have the report of the Auditing Committee.

MR. M. D. MOORE: Mr. Chairman, the Auditing committee report that they have examined the books, accounts, and vouchers of the secretary-treasurer, Mr. G. R. Canby, foi the fiscal year ended December 1, 1931, and have found the same correct, and that all disbursements are supported by proper vouchers.

MR. ENGLAR: I move the report be accepted.

The motion was duly seconded and carried.

CHAIRMAN HANSON: The next is the report of the Resolutions Committee. Mr. Cohill.

MR. COHILL: I offer this resolution:

"We, the members of the Maryland State Horticultural Society recognize the fact that the horticultural industries of Virginia, West Virginia, Pennsylvania and Maryland have many problems in common both economic and scientific.

"We therefore resolve that it is our desire to have our officers co-operate with the officials of all State Horticultural Societies, and especially those of the States mentioned,

in working out common problems of our industry, and be it further

"Resolved, That we commend the work of our Department of Horticulture, Entomology, and Plant Pathology in co-operating with the same departments of the other States mentioned, in working out scientific and practical problems of common interest to our industry in these States."

I move the adoption of the resolution.

The motion was seconded by Mr. Englar and carried unanimously.

CHAIRMAN HANSON: The next is report of the Nominating Committee. Mr. Englar.

MR. ENGLAR: In view of the situation in which we find ourselves with reference to the world markets as explained by our president in his address yesterday morning, it seems wise that we ask him to serve us again this year, as he is in touch with the situation better than the rest of us. The Committee submits the following nominations:

President, G. S. L. CARPENTER
Vice-President, W. EARLE WITHGOTT
Second Vice-President, RAYMOND C. HANSON
Secretary, G. RUST CANBY
Assistant Secretary and Treasurer, A. F. VIERHELLER

Executive Committee

G. HALE HARRISON	W. EARLE WITHGOTT
E. D. MCCAIN	J. A. COHILL
ALBERT ALLEN	FRANK HANSON
E. C. AUCHTER	A. L. TOWSON
H. C. WHITEFORD	J. WALTER ENGLAR

MR. LEE ALLEN: I move the report of the Nominating Committee be accepted.

The motion was duly seconded and carried.

CHAIRMAN HANSON: I reappoint Mr. H. C. Whiteford as our Representative in the Maryland Farm Bureau Federation. He has served us well for several years.

CHAIRMAN HANSON: We will next hear a talk on "The Importance of Soil Moisture in Fruit Growing," by Dr. John R. Magness. Dr. Magness.

DR. JOHN R. MAGNESS: Mr. Chairman and Members: After passing through the experience of the past two years, I think all of you are vitally interested in this question of moisture supply to the orchard, and just exactly what the effect of varying moisture conditions in the orchard may be.

The moisture supply of the tree is undoubtedly one of the most important factors in controlling the functioning of the tree, and I am going to repeat a few things that we said last year, as a background to our further discussion of the experimental results that we had during the past two seasons, on a detailed study of the interrelations between moisture supply and tree functioning.

I think all of you are familiar with the general functioning of the leaf of our fruit trees. You are familiar with the fact that the leaf is the organ of the tree in which the carbon dioxide, which is present in the air in very small amounts, is taken into the tree and is there combined chemically with water from the soil to form the carbohydrates or the sugars, the starches, etc., which after all are the true foods of the plant, materials from which the fruit is formed, and the materials from which the wood, bark, and other tissues of the tree are very largely made up.

The structure of the leaf is rather complex. On the lower side of the leaf we have literally tens of thousands of small pores or stomata through which this carbon dioxide from the air enters the leaf. To a very large extent, the amount of this carbon dioxide which enters the leaves of the tree will determine the total amount of these true food materials, or the total amount of fruit that can be built per acre during the season.

For that reason the amount of foliage on the tree is all important in determining how much fruit can be produced, because the larger the amount of leaf surface, the greater the amount of this carbon dioxide that can enter the leaves.

In addition to the necessity for leaf surface, we also have the necessity for these pores on the leaves to remain open through a long working period each day, because it is only when these pores are standing open that the carbon dioxide from the air can enter. Carbon dioxide is present in the air only in three to four parts in ten thousand parts of air, so that it is only as you have a large leaf surface, and the pores in that leaf surface are open, to receive the carbon dioxide, that it is possible to get an appreciable building of these food materials in the leaves.

The moisture supplied to the tree is apparently the most important controlling factor in how long these pores in the leaves remain open each day. These pores open at daylight in the morning and stand open until such time, under normal growing conditions, as the water supply in the leaves becomes just a little bit short, and then they close down.

If we have plenty of soil moisture, these pores will stand open through most of the day. They will stand open perhaps until noon under extremely hot and dry conditions, and if it is a day of moderate temperature and moderate humidity they will stand open all day. So that from that point of view the moisture supply in the soil is very largely the controlling factor in the way the leaf functions to build these food materials.

The moisture supplied to a tree varies, of course, with a good many factors. Soil has a certain capacity for holding water. Within limits, moderately heavy soils, loams with some clay in them, will hold a great amount, a greater amount of water than sandy gravelly soils. The fineness of the soil is a factor in the total amount of water it can hold.

All of this water in the soil, however, is not available to the plant. For each soil we have a lower limit beyond which the plant cannot draw out the water. With our loam type of soils, for example, most of them will hold perhaps 22 to 24 per cent of their weight in water. The rest of it

will drain out. When these soils are wet they will hold up to that amount of water, and then the rest of it will drain out, and there is in such soils perhaps six to ten per cent of water which cannot be used by the tree. So that we have, then, these upper and lower limits which represent the amount of water that is available to the tree and available for growth.

That is largely determined by soil. Our trees normally go into the growing season in the spring with that soil saturated about to its maximum capacity. In other words, if we get anything like normal winter precipitation, our soil down to a depth of several feet, if we have that much soil, will be saturated to the fullest capacity. So that that represents at the start of the growing season our reserve of moisture. That may amount to several inches; it will in a good loam soil, be equivalent to several inches of rain fall. It is stored up there at the start of the growing season.

Then, of course, we have rains that come through the summer to add to that supply. Usually, however, there is not a direct shortage of water for the trees in the early part of the growing season. The amount of rainfall that we have added to the amount of water that is stored up there in the tree will probably give you plenty of moisture to carry your trees through, even though the rainfall may not be very heavy until midsummer. Then if we have a fair distribution of rainfall through the summer, they will go on through the season with a fair amount of moisture throughout the season.

On the other hand, if our summer rainfalls are very short, then the amount of water may become a limiting factor by midsummer. During the past two years we have made a careful study of the moisture conditions and the way the fruit grew, and the way the trees functioned under western Maryland conditions.

The question of moisture supply on fruit bud formation is very interesting. All of you know that we had a very heavy fruit bud formation on the whole through this sec-

tion of the country this year following the very dry conditions last year. We got that same condition on our plots. That is, the plots that were dry formed nearly as many, in fact, a few more fruit buds than the plots that were irrigated last year. We don't know why we get fruit bud formation under dry conditions, but I believe that it is due to the fact that, when we get a shortage of moisture supply, we also get a shortage of the movement of materials from the leaves throughout the tree. The chemical analysis we have made indicates that you get some food formed in these leaves when they are getting dry before they reach the very extreme condition, but that that food does not move away from the leaves or the buds quite as rapidly as it does if we have plenty of moisture in the tree, and we have these translocation channels functioning completely. And so we may get a whole building up of food materials right around the leaf and the bud, even though we have these dry conditions.

Apparently fruit bud formation itself tends to be increased, at least by moderately dry conditions, rather than decreased. We didn't thin the fruit from any of those trees, and we got about double the number of bushels per tree in 1930 from our irrigated plots, but apparently with that abundance of moisture, most of the fruit, most of the food material, went into the fruit on these trees that were bearing a very heavy crop, and we had only a light fruit bud formation. Where this was coupled with thinning, we had a very satisfactory fruit bud formation, although not any more than where water had not been applied.

I think perhaps one of the greatest effects of drought, however, is in the holdover effect on the growth condition of the tree. I mentioned that these plots that were dry during 1930 formed such weak growth in the spring of 1931 that we felt our plots were no longer anywhere nearly comparable. The plots that were dry during 1930, which suffered seriously for water, formed only very feeble growth this spring, even though they were all fertilized alike and all handled alike in every way, except the water supply.

The terminal growth was less, the spur growth was less, the spurs, of course, were smaller; they hadn't had this storage of food, as much storage of food from the season before; the leaf area on those trees was less than half as great this year as it was in the trees that received irrigation. In other words, the holdover effect of that very serious suffering for water which we believe is largely tied up with decreased leaf function, was very serious. We got somewhat the same conditions we would expect from partial defoliation, from insect injury, or other causes.

The results so far have shown very clearly that if we want to keep our trees in the best condition it is absolutely essential to provide or to have the most uniform possible moisture condition. That probably is nothing new. The question is, what, if anything, can we do to bring about this condition? After all, there are certain limiting factors that we cannot overcome where we are growing trees under natural rainfall conditions.

I think one thing, however, that has been responsible, not only as the result of this work, but other work, is that perhaps the question of tree spacing is more intimately tied up with moisture supply than almost any other factor. When our trees are young, when we have a relatively small leaf surface per tree, the trees can be crowded pretty close together and still get by pretty good. But as the trees get larger and the leaf surface increases between the demand for water becomes greater, and the amount of water that can be stored, or the amount of rain water that we can collect does vary directly with the amount of space per tree that we have.

In other words, if our trees are forty feet apart we have four times as much water storage in the spring, and we are collecting four times as much water per tree through the summer as we have if our trees are only twenty feet apart. If you can control moisture supply and fertilize, then you can grow trees as close together as the space at the top will permit. That is one reason why the Western apple growers

have been able to carry as high as sixty and seventy trees per acre, and still get very good production per tree. They have supplied water, organic matter, and fertilizers, but where we are depending on natural rainfall, that question of tree spacing is vitally important. I think you all are familiar with the general relationship between the organic matter content of the soil and water-holding capacity.

If you increase the organic matter content you will increase storage, increase reserve of water at the start of the season. Consequently, your trees will go just a little bit longer before they begin to suffer seriously for water.

Another very important factor is the question of holding the water that we get. That is especially true on many of these steep orchards where the rainfall comes in heavy summer downpours. We may get enough total inches of rain during the summer, but most of it runs off the surface. Organic matter in the soil, of course, tends to open it up, make it absorb water more readily, and help in taking up moisture.

One of the very best methods to be sure you get the moisture that falls, is mulch, and especially with outside materials. If you have a mulch of straw or other outside material on the ground, it is going to take a pretty heavy downpour to have any surface run-off, and if the water goes into the soil, that is where it is available to the tree.

Some of these crops, especially such crops as sweet clover, which live a relatively short time and which are deep-rooted, will tend to open up the soil and make it take water more readily; but whatever steps are necessary to reduce run-off, certainly should be taken if we are going to make use of the water that we get.

Another factor, of course, that influences water supply is pruning. We can grow a larger number of trees per acre and keep the size of those trees down by pruning and reduce within limits the water requirements of each tree. We will probably reduce the yield per tree, but under limited water supply we cannot hope to obtain as much yield per tree as we can obtain if water was not a limiting factor.

This work has opened up a good many interesting possibilities or thoughts from the standpoint of soil management. I was interested in Dr. Cullinan's statement in regard to root distribution under mulch and under cultivation. We found in this work that if our orchard is dry and we get a quarter of an inch of rain, it affects the growth of that fruit. We were working here under sod conditions. Our roots were right up to the top of the ground. If any moisture at all came, there were roots there to get it. Under cultivation it probably would take a heavier rain to affect the tree, because roots are deeper, and if roots are down four or five inches it takes perhaps an inch of rain to actually get down to them, and if you get just a little rain it will tend to evaporate out of the surface, so at least there is a possibility that if roots are close to the top they get more benefit from local showers through the summer than they do if we keep them down. It is, however, the roots that are deep down that saves the tree under conditions of extreme drought. We may have all of the available water pulled out of the top two or three feet of soil, yet, we will have enough roots reaching down to keep the tree alive, keep the foliage on the tree ready to go whenever moisture is restored; so, after all, it is the deep roots that save the tree when we run into conditions such as we had last summer.

MR. NEWCOMER: How much of this mulch would be required in the way of thickness, and how many tons to the acre would it take to mulch an orchard?

DR. MAGNESS: I cannot give exact figures on the amount it would take to mulch an orchard. If you had even two or three inches over the surface it would help cut down the runoff a great deal. Of course, the more you have, probably the better, but I believe that with four or five tons per acre of mulch material like straw, you can greatly reduce your run-off and hold the moisture that falls. Of course, more would be still better. Whatever you can apply would be helpful, especially if you have certain bare spots

or spots where the ground is very hard. I believe it would pay to try to hold the moisture on those spots.

QUESTION: Can you take care of the mice?

DR. MAGNESS: I think most of the growers feel that with thorough poisoning they can keep the mouse population down. It also helps to not pile the mulch right against the tree, but rather heavy on the outside. From the standpoint of washing and run-off it is necessary to have it all on the ground and keep away from the trunk.

CHAIRMAN HANSON: Are there any further questions or any further business to come before the Society at this time? If not, the meeting is declared adjourned.

The meeting adjourned at one o'clock.

REPORT

OF THE

Twenty-Fifth Annual Meeting

OF THE

Maryland Crop Improvement Association

Wednesday and Thursday,

January 6 and 7, 1932

BALTIMORE, MARYLAND

The twenty-fifth annual meeting of the Maryland Crop Improvement Association was held at the Lord Baltimore Hotel, Baltimore, on January 6 and 7, 1932. The first day's program was held in co-operation with the Maryland Vegetable Growers' Association and the Maryland Tobacco Growers' Association. The program presented was as follows:

WEDNESDAY, JANUARY 6, 1932

9.30 Call to order by T. C. Brown, manager, Maryland Tobacco Growers' Association.

1. Fertilizer Recommendations under the New State Law.

PROFEESOR J. E. METZGER, University of Md.

and

L. E. BOPST, Associate State Chemist.

10.00 **2. Crop Rotation and Soil Fertility Problems.**

A. For Dairy Farms.
J. W. MAGRUDER, County Agent, Howard County.

B. For Truck and Canning Crops.
H. H. ZIMMERLY, U. S. Department of Agriculture.

Discussion by Professor T. H. White, Univ. of Md.

C. For Tobacco.
DR. W. W. GARNER, Bureau of Plant Industry, U. S. Department of Agriculture.

12.30 Adjourn.

THURSDAY, JANUARY 7, 1932

Maryland Crop Improvement Association.

9.30 Call to Order by the President, Ira V. McKenzie.

9.40 Present Status of Corn Breeding.
DR. W. B. KEMP, University of Maryland.

10.30 Broadcast vs. Hill Fertilizing.
PROFESSOR ROYLE S. THOMAS, Univ. of Md.

11.20 Use of Crop Land in Maryland.
RUSSEL G. ROTHGEB, University of Maryland.

12.00 Committee Reports.

FERTILIZER RECOMMENDATIONS UNDER THE NEW STATE LAW

By J. E. METZGER

The annual fertilizer, manure and lime bill of Maryland farmers, according to the last census, is more than five and one-half million dollars. This farm expenditure is exceeded in only two other commodity items, namely, for labor and for feed not raised on the farm. In as much

as the use or non-use of fertilizers affects the size of each of these other items and has an important bearing on the net income of the farms, it is very important that the purchase and use of plant food materials be attended with greatest care and thought.

There are several common or well known viewpoints regarding recommendations in the merchandizing and use of commercial fertilizers: First, the recommendation may be made entirely upon the reputed needs of the crop to be grown. Second, the requirements of the soil type may be made the basis of prescribing the treatment. Third, the farming system and crop rotation may be the chief factors for consideration in determining the kind and amount of fertilizer to use.

In the outline of "standard analysis fertilizers" due consideration is given to each of these methods. It should be mentioned, however, that for the field crops more attention is given to such factors as the soil type and the farming system than to either plant requirements or the chemical analysis of the soil. This is justified on the basis of the results of extensive field tests made in the State on the one hand and upon the requirements of different soil types for the maintenance of a satisfactory level of fertility on the other. In fact, most of these analyses are predicated upon the fertility maintenance basis and for this reason they are not necessarily the best analyses to use where the building of a reserve fertility is the immediate objective. In most cases of fertility building, however, it is mainly a matter of quantity of fertilizer to be used.

In addition to the complete fertilizers recommended in the "standard analyses" list, it is important to note that single ingredients, such as nitrogen-bearing materials, superphosphate and potash are not excluded. In fact, it is urged that they be used where conditions warrant it.

In the change from an ammonia to a nitrogen basis and through the maintenance of even units, nearly all of the new analyses are actually better fertilizer mixtures than

MARYLAND STANDARD ANALYSIS FERTILIZERS

Analysis	Total Units	Recommended for	
		Piedmont, Western and Southern Maryland	Coastal Plains—Eastern Shore*
2-8-5	15	Corn. Corn, small grains, cannery corn, late potatoes.	Corn, late potatoes, cannery corn, and grains on the heavier soils and for legumes on unmanured soils.
2-12-4	18	Wheat, winter barley and corn on dairy farms and where fertilizer is divided between the grain crops.	Late potatoes and grains on Loams and heavy soils.
0-12-5	17	Soybeans, cow peas, top dressing alfalfa, and on corn and grass land that is heavily manured.	Alfalfa, clovers, soy beans, cow peas, and pasture on manured land.
2-8-10	20	Sweet potatoes on sandy soil with manure and for root crops such as carrots, beets, parsnips.	
3-9-10	21	Sweet potatoes, carrots, parsnips, turnips, and other root crops without manure or legumes.	
4-8-5	17	Sugar corn, asparagus, cannery peas and beans, cucumbers, canteloupes, late potatoes and lima beans, and grains on sandy soils.	
4-8-7	19	Tomatoes in rotation with field crops.	Tomatoes in rotation with field crops and after a green manure crop.
6-6-5	17	Early potatoes, asparagus and other truck crops.	Early potatoes, and broccoli.

Special Fertilizer Analyses for Tobacco**

4-8-12	24	Without either manure or legumes in the rotation and on rested land.
0-12-10	22	With both manure and legumes in the rotation.
2-12-8	22	With manure in the rotation.
2-8-10	20	With legumes in the rotation.
6-6-8	20	For tobacco seed beds.

Analyses expressed as (N) Nitrogen, (P) Phosphorus, and (K) Potash.

* Representatives of the Delaware and Maryland Agricultural Experiment Station concur in the recommendtions for the Del-Mar Peninsula.

** Potash from high grade sulphate of potash.

University of Maryland
Department of Agronomy

were the old recommended group. This is due largely to the fact that the percentage of nitrogen is somewhat higher in the new analyses.

Field plot records indicate that for maintenance of high soil fertility only a few distinct analyses are actually needed.

As an all around fertilizer for a corn, wheat and hay (hay or pasture the second year) rotation, where manure is used for the corn, the 2-12-4 analysis doubtless is the best. On the Coastal plains soil, it might be better to have six units of potash instead of four. In practice, one would use a total of 500 to 600 pounds per acre per rotation. This would be divided about equally between the corn and wheat or other small grain crop. Substitutes for the 2-12-4 analysis would be best made by selecting either a 2-8-5 or a 3-8-10. The latter for field crops on sandy soils and where the manure supply is rather to limited.

Where the manure supply is abundant, much use should be made of the 0-12-5 analysis. In fact, under the conditions which exist on the larger dairy farms this analysis seems the most logical, and certainly better than any fertilizer with a lower number of phosphorus units. In adverse seasons it would be desirable to reinforce this mixture with some nitrate nitrogen. The same may be said for instance of late planting of a fall crop.

There is not enough difference between a 4-8-7 and a 4-8-5 to warrant the purchase of each of them for use on a given farm except for very special purposes and conditions. The 4-8-7 may be used to best advantage on sandy soils for the same crops and under the same rotations that a 4-8-5 would be used on heavier soils of the Piedmont and Mountain Valley farms.

The new 6-6-5 is higher in nitrogen than the old 7-6-5 by about one-quarter per cent. It is, therefore, a better early potato fertilizer than the old analyses, and also it is as good for top dressing pasture lands and the fertilization of garden crops as formerly.

A large majority of the field tests indicate that a 1-2-3 ratio is best for tobacco. This analysis is most strongly favored for general use, but there are special cases where one of the other recommendations may fit best. It is possible that an occasional situation may make it advisable to use a fertilizer treatment not incuded in the list. In these instances it is strongly advised that the grower consult the local county agent.

Time will not permit going into further detail. It is urged, however, that farmers buy the higher grades of mixed fertilizers because the unit cost of plant food is lower and, if expenditures must be held down, that this be achieved through the slightly reduced rate of application rather than through the use of low grade goods. Further, it is safer to proceed upon the basis of maintaining a satisfactory level of fertility than to depend upon the probable seasonal needs of a given crop to be grown.

FERTILIZER RECOMMENDATIONS UNDER THE NEW STATE LAW

By DR. L. E. BOPST,

Associate State Chemist.

Mr. Chairman, I desire to express my appreciation for the opportunity that has been afforded me to address this audience. It is always a pleasure to discuss one's own work in public, and doubly so before an audience which may be expected to take not only an intelligent, but a sympathetic interest in that work.

Professor Metzger has asked me to confine my remarks this morning to a brief discussion of the more important changes which are embodied in the new fertilizer law of Maryland which went into effect on January 1. The people of Maryland spent, last year, about five million dollars in fertilizer purchases. The protection of our citizens to the extent of assuring them that they are getting value received for money spent is of very great importance. Maryland

voters recognized this need for protection by placing upon the statute books of this State what may be referred to as the Fertilizer Control Law. An act governing the manufacture and sale of fertilizer first passed the Legislature prior to 1890. This orginal act has been modified on several occasions, the last of which was by the Legislature in 1931. For a number of years efforts have been made in this section to provide uniform laws and regulations covering matters pertaining to fertilizer inspection, and thus make possible a clearer understanding of the same by farmers of the States along the Atlantic Seaboard north of Virginia. Maryland made a decided step forward, towards the accomplishment of this purpose, when they enacted a new fertilizer law last year. There are four major changes embodied in this act as compared to the one under which we formerly operated.

The first change of major importance provides for guarantees for nitrogen, available phosphoric acid and potash on fertilizer containers, thus eliminating the use of the word "ammonia." Nitrogen is present in fertilizers in many different forms, among which may be mentioned, sulphate of ammonia, nitrate of soda, cyanamid, calcium nitrate, potassium nitrate, ammonium phosphate, tankage, fish and other animal plant by-products. However, nitrogen in the ammonia form is present in only a few of these materials. This reason, as well as our desire to coincide our guarantees with international usage, made it desirable that the element "nitrogen" and not one of the forms in which it occurs in the product should be used. One per cent of nitrogen is equal to 1.22 per cent. of ammonia. If you purchased a 2-8-5 fertilizer last year, the guarantee "2" represented ammonia; if you purchase a 2-8-5 fertilizer this year, the guarantee "2" will represent nitrogen. You will actually receive 8.63 pounds more of plant food per ton than was delivered you last year under the same guaranty. All but two States in the United States now provide for guarantees in the form of nitrogen and not ammonia.

The next change of major importance was the elimination by the Legislature of that proviso requiring your control organization to publish commercial values in our fertilizer bulletins. We have felt for some time, and I am convinced rightly so, that the publication of such information by us often created in the minds of certain fertilizer users the belief that fertilizers should be sold for the values as noted by us. We have always taken the utmost care, however, to bring to our readers' attention the fact that these commercial values were used solely to compare the plant food guarantees as made by the industry with those as found by our chemists. They were never intended to represent retail selling prices. The establishment of retail selling prices does not come within the scope of the duties of the control organization, but is unquestionably a merchandising problem and belongs to the industry.

The third major modification of this new law deals with the sending of fertilizer samples by purchasers to College Park for chemical examination. This gratuitous examination of fertilizers for residents of Maryland has been the source of considerable trouble to us. We consider the taking of a sample of fertilizer as of just as much importance as the preparation of this sample for analysis, or the chemical examination itself. A sample that is not representative of the lot of goods purchased is of absolutely no value and worse than no sample at all. We have received for examination, just this past year, samples of fertilizer from farmers of our State that were taken from only one bag, which container had been in the hands of the farmer nearly four months before the sample was sent to us. The bag had been kept in a small corn crib, where it was subjected to rain and an accumulation of dirt and dust. This sample naturally was found by us to be deficient in total plant food content, and the farmer immediately notified the fertilizer manufacturer that he did not intend to pay his fertilizer bill for the ten tons of goods that he had purchased. This, of course, was not fair.

Summarizing this whole situation, it is our desire to render this service of gratuitously examining fertilizers for Maryland farmers, but we must insist that the sample be accurately drawn and that enough sacks be sampled so that the lot of goods may be truly represented. Our new law specifically provides that such samples must be taken under certain rules and regulations that are prescribed by the Control Service. Any person desiring to send a sample of fertilizer to College Park for examination may do so by securing a printed form from us, filling in the information required and enclosing it with the sample. In this way the results obtained will be not only of value to the party particularly interested, but also to the public at large.

The fourth and last change involves penalties for violations. Those of you present who were intimately familiar with the fertilizer law on our statute books last year know that it was possible for fertilizer manufacturers to sell in this State misbranded and adulterated products with absolute impunity. By that I mean there was no penalty provided in the old statute which would make it possible for your control organization to initiate legal action against manufacturers for selling products not entirely as represented. This omission in our old law is amply taken care of in the new statute, as there is a penalty section included which makes it possible for members of the Control Service to prosecute manufacturers for selling deficient products.

That, in brief, Mr. Chairman, represents the major differences between our old law and the new. Your State Laboratory analyzed, during the year 1931, 1,255 samples which were taken from shipments intended for Maryland consumption. Of this number, only twelve were considered seriously deficient. I would like to take advantage of this opportunity to pay public tribute to the members of the Maryland fertilizer industry to the extent of saying that 95 per cent of the goods sold in this State is entirely as represented. However, there is a small per cent of the industry who, either through carelessness or for some other reason,

have sold products that were misbranded and adulterated. We cannot anticipate a time when vigilance will not have to be exercised. I assure you that we shall continue to make every honest effort to see that the farmers of this State, when buying fertilizer, will get at least what they pay for.

CROP ROTATIONS ON DAIRY FARMS

By J. W. MAGRUDER,

County Agent, Howard County, Maryland.

The cost of feeding a dairy cow, as a rule, amounts to from 50 to 60 per cent of the cost of keeping the cow. Saving in feed cost, therefore, is one important way of increasing the profit from the dairy herd. In general, dairy feed can be produced on the home farm cheaper than it can be purchased. Plenty of good quality roughage of high protein content supplemented by corn, barley and a small amount of a high protein grain will make an excellent dairy ration. A 1,200-pound cow producing 9,000 pounds of milk per year, testing 3.5 per cent butterfat, will consume approximately a ton and a quarter of alfalfa hay, four tons of corn silage, one-half ton of corn stover, 800 pounds of corn and cob meal, 800 pounds of barley, 200 pounds of cottonseed meal and 200 pounds of linseed meal, beside grazing on good pasture for five months. All of these foods, except the small amount of cottonseed meal and the linseed meal, can be produced on Maryland farms in great abundance, providing good soil management and cropping systems are practiced.

A study of the total digestible nutrients and crude digestible protein produced by different farm crops grown in Maryland shows the importance of growing crops, such as corn silage, alfalfa hay and barley to feed dairy cattle.

An acre of corn yielding 7.8 tons of silage supplies 2,761 pounds of total digestible nutrients and 172 pounds of crude digestible protein. An acre of alfalfa yielding 2.4 tons per acre supplies 2,477 pounds of digestible nutrients

and 509 pounds of digestible protein. An acre of timothy hay yielding 1.4 tons per acre will supply only 1,358 pounds of digestible nutrients and 84 pounds of digestible protein, just about half as much digestible nutrients as alfalfa hay and only one-sixth as much protein. Oats yielding 31½ bushels per acre supply 710 pounds of digestible nutrients and 98 pounds of digestible protein as compared to 1,239 pounds digestible nutrients for barley and 140 pounds of digestible protein, the yield of barley being 32½ bushels per acre.

The yields cited in each case are the average for the State of Maryland. These figures indicate the wide variations in the amount of nutrients that can be produced per acre, depending upon the crop selected.

The traditional five-year rotation, which includes corn, wheat, timothy and clover hay, and timothy pasture, no longer meets the requirements of a good rotation for the production of the best dairy feeds and the most nutrients per acre. This rotation includes too many acres of relatively unprofitable crops and also it provides only for a legume crop on the soil one year in every five. When the clover stand fails, as it commonly does, ten years elapse before a legume crop is grown in the particular field. Unless the field is manured heavily or a generous application of commercial fertilizer high in nitrogen content is made, the fertility of the soil will be reduced.

Anthracnose, a disease of clover has caused a failure on many Maryland farms during the last decade. As a matter of fact, it is becoming more difficult each year to secure a satisfactory clover crop because of this disease.

During the past decade it has been proven conclusively that alfalfa and sweet clover can be grown on practically every soil type in Maryland, when proper soil conditions are provided before the crops are sown.

Alfalfa and sweet clover do not work into the old traditional rotation very rapidly because of the nature of the plants. This necessitates the development of an entirely

new rotation on Maryland dairy farms if alfalfa and sweet clover are to be grown successfully.

Some dairymen have attempted to grow alfalfa by preparing a special field and sowing the whole acreage at once and letting it remain in the field as long as the alfalfa produces sufficient hay to justify harvesting. This is not a very desirable way of growing alfalfa. There is considerable risk in sowing alfalfa the first time, since the soil must be inoculated, well limed, fertile and well prepared in order to grow the crop. If any one of these conditions is not just right, a failure may be sustained. Quite often farmers do not have time nor ready capital to prepare a large acreage for alfalfa, whereas, they could handle a smaller acreage well. The weather conditions that follow the seeding of the crop may cause a failure which is very expensive. Another objection, too, is that the hay supply gradually diminishes each year until the field is plowed. It is questionable, also, whether it is good practice to let alfalfa grow in a field as long as it is profitable to harvest it, even though it may yield good crops for a number of years. Research studies at the Nebraska Experiment Station showed that when alfalfa was left in a field for eight or ten years the soil moisture in the subsoil was gradually reduced. Likewise, we might expect the subsoil fertility as well as that of the surface soil to be gradually reduced. It would appear for the sake of maintaining soil moisture and soil fertility that it might be best to grow alfalfa in a rather short rotation.

On most dairy farms it is best to follow two separate rotations when both alfalfa hay and sweet clover pasture are to be grown.

Professor Metzger discussed an alfalfa rotation at the Maryland Crop Improvement Association Conference last year. A number of you are probably familiar with this rotation. He advised a five year rotation of silage corn, barley, alfalfa, alfalfa and alfalfa. It was suggested that

a field of the desired acreage, close to the barn if possible, be selected for the rotation to make it convenient in filling the silo. This field should be well drained and rather fertile.

The advantages of this alfalfa rotation are: First, more high quality hay can be grown than is produced in the old rotation; second, only one-third of the alfalfa acreage is sown each year. This enables the farmer to prepare the soil better and apply more barnyard manure, lime and fertilizer and also he can sow more seed per acre than would be possible on a larger acreage, especially if the operator is limited in available operating capital. Third, if weather conditions should cause a failure, no great loss would be sustained as is the case when the whole alfalfa acreage is sown at one time; fourth, once the rotation is established the operator is always assured of hay because he has the second, third and fourth year seedings to harvest. A drought may cause an entire failure because a good crop is usually harvested as a result of the soil moisture accumulated during the winter months. This was demonstrated very clearly during the drought year of 1930. Fifth, a leguminous crop is on the land three-fifths of the time which should help improve the nitrogen and organic supply of the soil.

Since the field reserved for the alfalfa rotation is removed from the general rotation indefinitely, a separate rotation must be planned for the remaining fields. Very few dairymen have sufficient permanent bluegrass pasture to supply adequate roughage for their cattle through the summer season. Since sweet clover pasture furnishes more grazing than any other temporary pasture plant, the pasture rotation should include this crop. A three-year rotation of corn, wheat and sweet clover pasture is suggested. If there is a fourth field, this can be sown to permanent pasture.

The following outline shows the order of planting the three-year rotation. Suggestions as to maintenance of soil fertility are also given.

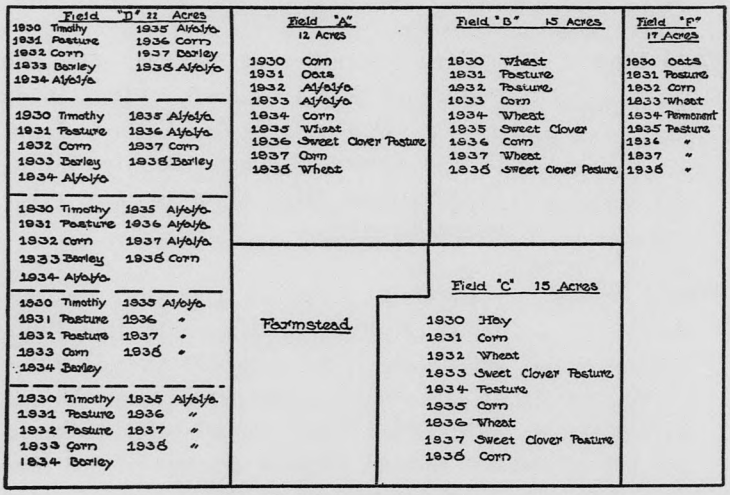
SWEET CLOVER PASTURE ROTATION

Crop	*Management*
Field Corn	Turn under 5 tons manure. Use 200 pounds of 2-12-4 or 2-8-5. Plant Reids Yellow Dent, Giffords Yellow Dent, Golden Queen, Johnson County White, Pennsylvania Sure Crop or any other adapted variety.
Winter Wheat	Plant 6 pecks of Currells' Prolific, Leaps' Prolific, or Mammoth Red October 1st to 15th. Use 300 pounds 2-12-4 or 2-8-5 fertilizer per acre. Lime the soil if needed. Sow 8 pounds of timothy in the wheat. Sow 10 pounds of scarified white biennial sweet clover and 4 pounds of alsike clover per acre March 15th to April 1st. A disc seeder is preferred. Inoculate seed if the field has never grown sweet clover. Sweet clover may be pastured by July 15th to August 1st.
Sweet Clover	Start pasturing in the spring when eight to ten inches high. Keep sufficient stock on the field to prevent the sweet clover from getting coarse.

With these two rotations in mind, I shall endeavor to show you how we are planning to adapt them to various dairy farms in Howard County. In conjunction with this I shall explain some variations to the rotations that may be well considered when conditions are favorable.

I shall discuss this by useing three cases where the rotation plans have been worked out by the farmers and myself.

Case No. 1—Farm Layout and Rotation Plan—85 acre Farm



NOTE: The farm layout is not drawn to scale. It is used merely to show the rotation plan.

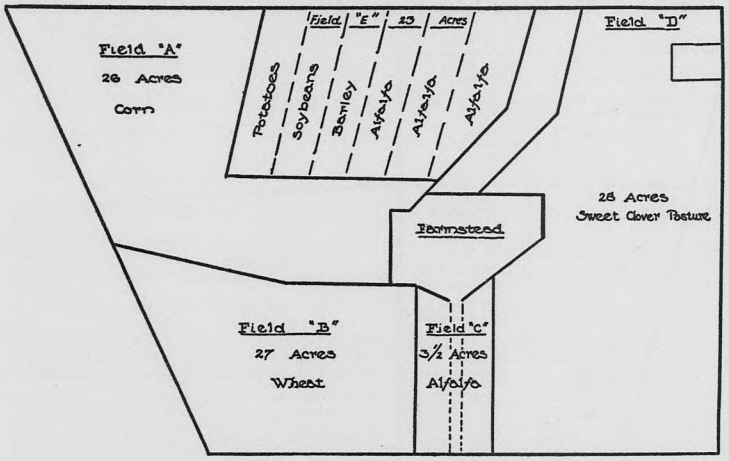
This is an eighty-five acre dairy farm. The operator is endeavoring to produce all of the alfalfa hay, corn for grain and silage, barley, and sweet clover pasture required for a herd of fourteen dairy cattle and the required number of heifers to be grown for replacement. There are five fields on the farm.

Field D is the most fertile and probably the best drained of the five in addition to being about the size needed to produce the required amount of alfalfa hay. This field therefore was selected for the alfalfa rotation. Field F is the furtherest away from the barn and will be sown to permanent pasture to take care of dry cattle and growing heifers. Fields A, B and C were selected for the three year rotation of field corn, wheat and sweet clover pasture. By following these two rotations on the eighty-one acres of tillable land on this farm the operator will have 4½ acres of silage corn, 4½ acres of barley, 4½ acres of first year alfalfa, 4½ acres of second year alfalfa and 4½ acres of third year alfalfa,

making a total of 13½ acres of alfalfa, and he will also have seventeen acres of permanent bluegrass pasture beside approximately fifteen acres each year of each of the following crops: field corn, wheat and sweet clover pasture.

The crops to be grown each year in the respective fields are shown in the diagram.

Case No. II—Farm Layout and Rotation Plan—123 acre Farm



The diagram shows a dairy farm of 123 acres that has practically completed the change to the new rotation plan. The alfalfa rotation is a slight variation from that of Case No. 1 to meet the market and soil conditions of this particular farm. The soil is well adapted to the growing of potatoes and the farm is located near Baltimore which offers a splendid retail and wholesale market for this crop.

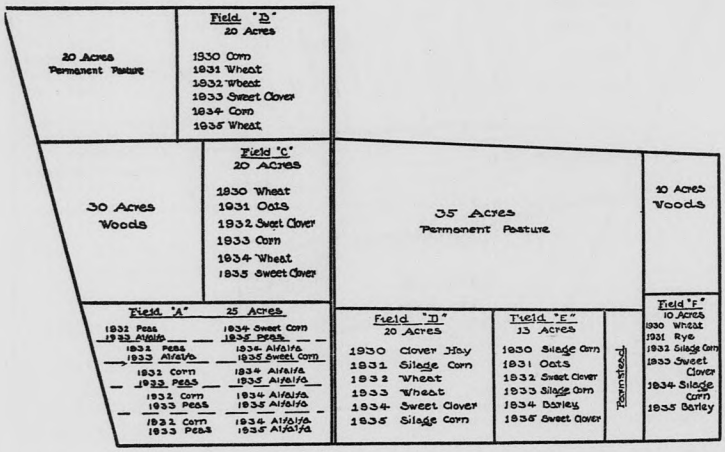
This dairyman is also milking fourteen head of dairy cattle and growing heifers for replacement.

In fields A, B and D he is operating a three year rotation field corn, wheat and sweet clover pasture. Fields E and C are operated together in a seven-year rotation of late potatoes, soybeans, barley, alfalfa, alfalfa, alfalfa, and

alfalfa. Field C is operated with field E to avoid growing corn in front of the dwelling.

These rotations enable the operator to grow approximately 27 acres of field corn, 27 acres of wheat, 27 acres of sweet clover pasture, 3½ acres of late potatoes, 3½ acres of soybean hay, 3½ acres of barley and a total of 14 acres of alfalfa.

Case No. III—Farm Layout and Rotation Plan—216 acre Farm



This is a 216 acre dairy farm with 103 acres of tillable land. Twenty head of dairy cows in addition to heifers for replacement are being fed on this farm. This particular farm is located conveniently to several canning factories which offers a fairly good market for sweet corn and canning peas.

Field A seemed to be best adapted to the growing of alfalfa and was selected for this purpose. A five year rotation of sweet corn, peas, alfalfa, alfalfa and alfalfa is carried out in this field. The alfalfa can either be sown in the peas during late March or early April or the peas can be harvested and the land prepared for the sowing of alfalfa during August of the same year.

In order to grow the silage corn near the barn, fields E and F are cropped the same as if they were a part of fields C and B respectively with the exception that silage corn and barley are grown in fields E and F rather than field corn and wheat as shown in fields C and B.

By growing the same crops in fields B and F, and C and E, respectively, and farming them with field D, a three year rotation of silage and field corn, barley and wheat, and sweet clover pasture is practiced.

These rotations enable the operator to grow 5 acres of sweet corn, 5 acres of peas, 15 acres of alfalfa, approximately 30 acres of silage and field corn, 30 acres of wheat and barley, and 30 acres of sweet clover pasture.

The problems involved in changing from the old rotation to the new one as shown in the three foregoing cases are about the same as those with which the average dairyman will be confronted. They serve also in showing what possibilities there are in diversifying the income on dairy farms by growing some intensive cash crops where the soil conditions and markets warrant.

Some dairymen may find that they can produce more feed than their cattle can consume with these rotations. If his basic allotment of milk and the market demand does not justify enlarging his dairy herd, then he may well consider feeding a few hogs to use up surplus grain and pasture. This cropping system lends itself to the raising of other livestock as well as dairy cattle. Any surplus in alfalfa hay can either be carried over for another year or it may be sold since there is usually a ready market for this kind of hay.

In discussing these rotations, I do not want to convey the thought that all dairy farmers in Maryland should undertake to sow alfalfa now. It is probable that many farmers should never undertake to sow it. Alfalfa should not be sown until the soil is in a good state of fertility. It may take years on some farms before the fertility of the soil can be raised so that alfalfa can be grown successfully.

There are other farms where the surface and subsoil drainage will prevent alfalfa from growing. Many soils will cause alfalfa to heave during the freezing and thawing in the winter. Farmers confronted with these conditions should correct them before sowing alfalfa.

There are many dairy farms in Maryland suitable for growing alfalfa. The adoptions of the alfalfa and sweet clover rotations on these farms will enable these dairymen to lower the cost of producing milk materially.

CROP ROTATION AND SOIL FERTILITY PROBLEMS IN TOBACCO CULTURE

By W. W. GARNER, Bureau of Plant Industry U. S. Department of Agriculture.

In the experiments conducted at Upper Marlboro much attention has been given to development of systems of crop rotation especially adapted to culture of tobacco. However, it may be stated at the outset that the ideal rotation system for tobacco has not yet been found, so that, under the circumstances, the best that can be done is to briefly present to you the results thus far obtained in these studies. It is not difficult to find cropping systems involving use of soil-improving crops which will insure satisfactory yields of tobacco but to devise cropping methods which will consistently produce the highest quality of leaf is quite another matter. It is believed that the problem of devising a thoroughly satisfactory system of rotation is about the most important one now confronting the tobacco growers of Southern Maryland.

The type of tobacco produced in Southern Maryland, so far as we know, has not been successfully duplicated in any other locality in this or other countries. This type resembles in some respects our cigar-binder leaf types and it still more closely approaches White Burley in certain

characteristics. However, the Southern Maryland product possesses distinctive properties which make it a very valuable type for certain purposes of manufacture. Its peculiar characteristics are undoubtedly due primarily to local conditions of climate and soil. That weather conditions have a very important effect on the character of leaf produced is made clear by the marked variations in quality obtained in different years on the same soil and with the same cultural methods. A crop grown under conditions of drought may be expected to be below standard in quality, especially with respect to requirements for the cigarette grades. In particular, the leaf tends to be woody in character, more or less reduced in size, relatively thick and heavy in body and comparatively poor in burning qualities. When the crop is grown under more favorable conditions as to rainfall, the leaf usually is comparatively thin, of light body, good size and has good burning qualities. Although weather conditions in themselves are quite beyond control we find a very valuable suggestion in the definite tendency of a rather liberal, evenly distributed rainfall to produce a thin, light-bodied, fine textured leaf such as is required in the relatively high-priced cigarette grades. This effect of the rainfall indicates the desirability of adopting measures which will increase the water-holding capacity of the soil.

That local differences in soil type have a marked effect on the properties of the tobacco leaf is well known and is emphasized by the striking differences in quality often seen in crops of tobacco grown on adjoining farms and on different parts of the same farm. Distinct differences in quality may be detected between crops grown on two pieces of land which show every indication of being practically identical in character. In other words, the tobacco crop may respond to differences in soil conditions which the soil specialist can not readily detect. It should not be surprising, therefore to find that the system of cropping which is followed may materially affect the quality of the tobacco produced on a particular soil.

If a piece of land inherently adapted to culture of tobacco which has been lying idle for a period of years and has been occupied by weeds is broken in the spring a peculiar mellowness may be detected which augurs well for the success of the tobacco crop. The same soil after having been in tobacco continuously for several years assumes a different character and to the sense of touch seems to feel more or less "lifeless". Under favorable conditions tobacco transplanted to the rested land grows off promptly and with remarkable uniformity. There is an excellent spread of leaf, the crop matures early and the size of the plants indicates a heavy yield. However, the actual weight of the cured product, though satisfactory, is usually less by a considerable margin than would be indicated by its size, which means that the leaf is comparatively thin, light-bodied and of fine texture. In general it also is of good color, and has excellent burning qualities. In short, the leaf meets the requirements for the best cigarette grades.

When the crop is grown on similar soil which has been in continuous tobacco culture for a period of years, a different result may be expected. Many of the plants are slow in starting their growth and the crop as a whole develops rather slowly and unevenly. The leaves do not show the fine spread seen on the rested land. The final yield usually is rather low but greater than the size of the leaf would indicate. Thus, the leaf is comparatively thick, heavy-bodied, somewhat coarse in texture and is not likely to have good-burning qualities.

The contrast in character of leaf to be expected under these two conditions may be illustrated by comparative results obtained in experiments at Upper Marlboro, conducted jointly by the State Experiment Station and the Bureau of Plant Industry. For a period of six years ending with 1930, the average yield on the rested land has been about 1,200 pounds per acre and the gross value nearly $400 while for the same period the yield with continuous culture of tobacco has been slightly less than 700 pounds

and the gross value about $80. The average price per pound of the leaf in the two cases has been 32 cents and 12 cents. In typical case, the leaf from the rested land when ignited continued to burn for more than 100 seconds while the leaf from the continuous culture plot burned only 10 seconds. It was found by test that for an equal area or size the leaf obtained under continuous culture was about 50 per cent heavier than that produced after weeds. These tests have been made on Collington fine sandy loam soil and for the "rested land" test tobacco has been grown in a two-year rotation with weeds, that is, after each crop of tobacco the weeds are allowed to grow through the following year, to be followed again by tobacco. It should be added that under continuous culture comparatively good crops of tobacco were obtained for a time but subsequently there has been a steady decline in yield and especially in quality.

A series of experiments has been carried out over a period of years in an effort to work out a rotation system to include soil-improving crops which would give results equaling those obtained on rested land. This has proved to be a difficult task. The trouble lies not so much in obtaining satisfactory yields but rather in securing the cigarette grades of leaf, which of course, command the best prices. These tests include: (1) continuous culture of tobacco with leguminous and non-leguminous cover crops; (2) two-year rotations of tobacco, wheat and legumes; (3) a three-year rotation of tobacco, wheat and red clover. In all cases a fertilizer equivalent to about 700 pounds of a 1½-10-7 mixture was applied to the tobacco but no fertilizer was used on the other crops in the rotation. The general trends of the results are shown by the data in the following table obtained for a period of 6 years ending with 1930.

Average Yield and Value of Tobacco Obtained in Cropping Tests at Upper Marlboro Over a Period of Six Years, 1925-1930

Cropping System	Yield per acre, pound	Value per acre, dollars	Price per pound cents
Tobacco on rested land, after weeds	1,211	388	32
Tobacco every year, no cover crop	686	81	12
Tobacco every year, rye as cover crop	787	103	13
Tobacco every year, crimson clover as cover crop	848	107	12½
Tobacco every year, hairy vetch as cover crop	1,106	137	11
Tobacco in 2-year rotation with wheat and crimson clover	1,012	155	15
Tobacco in 2-year rotation with wheat and cowpeas	848	86	10
Tobacco in 3-year rotation with wheat and red clover	1,236	260	21

Since these tests were begun it has been found that for the type of soil used the quality of the tobacco is improved by supplying 75 to 100 pounds of potash in the fertilizer instead of the 50-pound rate here employed. However, the same fertilizer formula was applied to all plots so that the results are comparable. The results obtained in the rotation with weeds and with continous culture without any soil-improving crop already have been considered.

Use of rye as a winter crop has given a slight increase in yield but has not materially improved the quality of the leaf. In this case the rye has been turned under when about a foot high. In earlier years when the rye was allowed to make considerably more growth before it was turned there was no consistent increase in yield of tobacco and, in fact, the yield often was reduced. Probably the value of rye as a cover crop will depend to a considerable extent on the type of soil, but in any case, it is important to turn it under before it has made too much growth.

Crimson clover as a winter cover crop has given on the whole about the same results as rye. Its general use in this way cannot be recommended. The tobacco crop usually does not mature early enough to permit seeding the clover at the proper time and quite often it fails to go through the winter.

Hairy vetch over a long period of years has been decidedly the most dependable leguminous winter cover crop. Almost without exception it has made excellent growth and unquestionably has added large quantities of organic matter and nitrogen to the soil. As a rule it has given satisfactory yields of tobacco but unfortunately the quality of the leaf has not been good. The vetch does not make sufficient growth till rather late in the spring and apparently turning under the green material shortly before transplanting tobacco does not give best results. The tobacco probably is supplied with too much nitrogen late in the season and does not ripen well. It is believed that better results will be obtained by allowing the vetch to occupy the soil through the year, thus following a two-year rotation of tobacco and vetch.

A two-year rotation of tobacco, wheat and crimson clover has given better results both as to yield and quality of the tobacco than continuous culture of tobacco with crimson clover as a cover crop. The crimson clover can be seeded at the proper time and has a much better chance of success. Under these conditions it has given good results in some years but nevertheless is subject to winter-killing and to injury from disease so that on the whole it has not been dependable.

Substituting cowpeas as a summer legume for the crimson clover in a two-year rotation including wheat gave good yields in the early years of the tests but in later years black root rot has caused a rapid decline in yield of tobacco. At no time has the quality of the tobacco been satisfactory in this rotation. On other soil types or for only a limited number of years fairly satisfactory results might be obtained with this system but it is doubtful if it can be relied upon generally to produce the best grades of tobacco.

The three-year rotation of tobacco, wheat and red clover, though falling short of the rested land in quality of leaf produced, has given excellent yields of tobacco and stands well above the other intensive systems in both yield and quality of the tobacco crop. This system which has long

been used in some of the other important tobacco-growing districts, as in Lancaster county, Pennsylvania, has much to commend it where the soil is suitable. In this rotation, the land may be said to be in a resting condition for a period of about 18 months after the clover is seeded and toward the end of the rotation there usually is considerable development of weeds. To what extent this enters into the comparatively good results obtained has not been determined.

It must be admitted that none of the intensive systems here tried has shown the conspicuous degree of success attained on the rested land; that is, the alternation of tobacco and weeds, but some important results have been obtained. It is hoped that by further study we shall be able to discover just why it is that such excellent quality of leaf is obtained after weeds. It has been found that mere resting of the land in itself does not fully account for the results. If the weeds are not allowed to grow while the land is at rest the tobacco produced rapidly declines both in yield and quality. It appears that a high content of organic matter in the soil is needed for best results in producing the cigarette grades of leaf but it is equally apparent that the character of the organic matter is quite important. In particular, it seems that adding to the soil large quantities of green manures in the fresh state is not desirable when tobacco immediately follows. It is also clear that in the free use of legumes the tobacco root disease factor must be taken into account.

THE PRESENT STATUS OF CORN BREEDING

By DR. W. B. KEMP, University of Maryland.

During the past few years no marked change has taken place in the attitude toward corn breeding. That is, no new procedures have been presented that seem likely to accomplish results beyond those that can be accomplished by the procedures now in use. The methods now in use

follow one or the other of two procedures. Either mass selection is practiced, or inbred strains are isolated, tested in crosses, and the promising strains are propagated to enter into crosses for the production of commercial seed.

By mass selection is meant the ordinary selection that a farmer practices when he saves seed either from the field or from the crib. Such selection can change markedly the characteristics and appearance of the corn plant or ear. However, it seems to accomplish little in obtaining a type capable of producing yields appreciably higher than those produced by any variety of corn that is well adapted to the climate and soil where improvement is desired. Ear-to-row tests and the breeding plots which accompanied them have fallen into practical disuse. Such tests showed striking differences in the yielding ability of the ears which were compared. However, evidence has accumulated which indicates that the observed differences trace chiefly either to differences in the seed condition or to the degree of hybrid vigor that they possessed. Usually, in the breeding plot which accompanied the ear-to-row test, precautions were taken to insure cross-pollination between the promising ear remnants. Hence, some hybrid vigor was carried from the breeding plot to the field, where its effect was observed for one year. What little information of permanent value arose from these tests indicates that dense, large kernels or ears, with a row number that decreases with reduced soil fertility, usually are conducive to some increase in yield. On the other hand, when qualities other than yield are sought, such as protein content of the grain, the foregoing methods are fruitful of significant positive results. However, yield usually is reduced when the extreme expression of such a quality is obtained.

The fact I have endeavored to express is the slight improvement in yield that man seems able to accomplish with corn if he resorts to selection only. Apparently natural selection results in a plant with yielding capacity nearly as great as that which results from intelligent arti-

ficial selection. However man has discovered natural forces that he is able to utilize by artificial means; forces that natural selection does not utilize regularly. I refer to hybrid vigor; the vigor that frequently accompanies the first generation of a cross between types within a species that offer markedly from each other.

During the past twenty years the ground work has been laid from which practical results are now appearing. The different agricultural experiment stations have been dusting silks on corn plants with pollen from the same plant and obtaining strains from the seed produced in this way. These strains lack much in vigor. However, after a few years of inbreeding a number of uniform lines are produced. When two of these lines are crossed, one upon the other, the first generation progeny that is obtained gives a yield much higher than that of the lines that were crossed. In fact, some of these crosses give yields well in excess of those produced by the parent varieties before inbreeding began. When two inbred lines are discovered, lines that give promising yield in their cross, this high yield may be produced year after year, merely by crossing these two lines to obtain the seed for planting.

There are several objections to the production of commercial seed in this way. The labor involved with the low yield produced from the crossing plot causes this seed to be very expensive. Also, the crop produced from this seed is so uniform and so specific in its requirements that these hybrids may succumb to unfavorable conditions more quickly than commercial varieties. Therefore, each hybrid must be tested carefully in any locality before it is safe to grow it on a large scale.

To overcome the expense due to low seed yield, double hybrids have been resorted to. That is, two first generation crosses are crossed together to produce a double hybrid which traces back to form inbred lines, instead of two. The high seed yields produced in the second crossing plot

helps to reduce seed costs. In the past few years evidence is accumulating which indicates that the two first generation crosses entering into such a double cross may be retained in isolation as open pollinated varieties without detriment to the double cross. This step again should reduce materially the seed cost.

For some years past the highest yielding lots in the Iowa yield competitions have come from seed produced according to one of the methods just mentioned. Now a few of the commercial seedsmen are putting such seed on the market. Within a few more years the crosses that are offered commercially will have been tested in the different regions and it will be possible to know which ones are well adapted within each area. When this is accomplished, and the results are made use of, we can expect an appreciable increase in corn yields throughout the United States. Until such adapted hybrids are available within any region, the most promising source of seed is that which has been saved carefully from the standard varieties which have proved themselves to be well adapted to the local conditions.

HILL VERSUS BROADCAST FERTILIZATION

DR. R. P. THOMAS, University of Maryland

The necessity for fertilization is no longer disputed. The question now is what is the best method and manner of applying this fertilizer for most economical returns. Shall I broadcast my fertilizer or shall I apply it in the hill or row—is the question which many of the fertilizer users of today have to meet. In recent years there has been considerable experimental work done to try to answer these questions. However, before discussing these experiments, we shall review briefly the reactions fertilizers undergo when applied to the soil.

There are certain basic principles which have to be considered in any system of fertilization. It must be kept in

mind that the nitrogen fertilizers to be available to the plant are either applied in a soluble form or are changed over to a soluble form by various agencies in the soil. On this account the nitrogen fertilizers or the nitrogen portions of a fertilizer can be considered as being free to move about in the soil as the water or soil solution. This is not the case with phosphorus and potassium. The phosphoric acid which we apply in fertilizers is very largely converted to an insoluble form when it is applied to the soil. The solubility of this depends on a number of conditions, but it is doubtful if under any conditions is it anywhere near as soluble or available as it was when applied. Potash fertilizer soon enters into the exchange complex in the soil, and, if the exchange complex is in the soil in large enough quantities, we have very little movement of potash in the soil. Since the available forms of nitrogen can move about in the soil, it matters very little where it is placed. For phosphoric acid and potash this is not true as very little movement takes place. This emphasizes the need for placing these materials in the soil so that they will not become insoluble and can be easily obtained by the plant roots.

Hill fertilization is trying to meet these requirments by placing a small amount of fertilizer so that it will remain available for the plant roots and in a position where it can be readily obtained by the plant. By doing this it is thought that a smaller amount of fertilizer will give much better returns than a large amount mixed with the surface soil, as would be the case in broadcasting. Some have raised the question as to whether such a practice will effect the rooting system of the plants. Observations have shown that hill fertilization has very little effect on the amount or spread of the roots of plants so fertilized. There is danger of effecting germination and subsequent root growth by having the fertilizer around the hill. This is probably due to too high a concentration of salts and burning of either the stalks or roots results. The promoters of hill fertili-

zation have tried to overcome this difficulty by placing the fertilizer at the side of the hill in such a manner that it doesn't come in contact with the young seedling and at the same time have the plant food in position where it is readily available to the young roots. Results of a large number of State experiment stations, in testing out methods of hill fertilization for corn, indicate that 125 pounds in the hill is just as efficient as 500 pounds of fertilizer broadcast.

There are several personal factors that enter into methods of fertilization. It is obvious that it will take longer to plant a field of corn if fertilizer is applied in the hill. However, this is offset by the fact that one less cultivation is needed if the fertilizer is applied and the grain is seeded in one operation. If the soil happens to be rather low in fertility or in a more or less unproductive state, hill fertilization may be objectionable. In poor soils a small amount in the hill sometimes does not supply enough plant food material to meet the needs of the growing crop, and very little returns are obtained. Often the residual effect of hill fertilizer appears in the succeeding crop and produces an uneven growth. Probably the fact that at the present we have no machinery which is altogether satisfactory for hill application of fertilizers has retarded its advancement. One of the experiment stations has been trying out an experiment with a large number of corn planters and found that there are only a few which actually place the fertilizer at the side of the hill, as recommended, and not in contact with the grain. Very few of the older type of fertilizer attachments are satisfactory.

Hill fertilization has not been used very extensively in Maryland except for a few special crops. Many farmers are prejudiced against such a method without having any sound reasons for such an attitude. At the present time time the farmer probably can employ profitably the hill fertilization method, if he has conditions which will permit its use. If he has a fertilizer attachment which will

permit placing the fertilizer at the side of the seed and not in contact with the seed and if the soil is not in too low a state of fertility, hill fertilization for such crops as corn should be much more profitable than broadcasting.

THE USE OF CROP LAND IN MARYLAND

R. G. ROTHGEB, University of Maryland

The title of this talk may suggest that it is to consist of a technical speech in the fields of farm management and agricultural economics. Such an attempt must be left to specialists in those fields. However, trends in field crop acreages and yields are of great concern to workers in Agronomy. It is hoped that facts of this nature can be used to advantage by farmers and farm specialists in dealing with the more vital questions of profit and loss in the use of land on the individual farms of the State.

It is interesting as well as instructive to take an inventory of the State's agricultural activities from time to time. The Federal Agricultural Census taken at intervals of five years together with the annual crop and livestock estimates collected by the U. S. Department of Agriculture keep interested parties posted on the acreage, production and price of the important commodities produced on the farms of Maryland and other States. It is the purpose of this talk to point out a few facts bearing on field crop production which are brought out by the last census report and by reports of crop estimates.

Division of Farm Land

In 1929 Maryland had 43,203 farms averaging 101.3 acres per farm or a total farm acreage of 4,374,000 acres. This farm acreage was classified according to use as indicated in Table 1.

Table 1—Classification of Maryland Farm Land for 1924 and 1929

	Percentages	
	1924	1929
Land in farms	100	100
1. Crop land total	50.2	48.7
a. Land harvested	79.8	81.8
b. Crop failure	1.7	1.8
c. Idle or fallow	18.5	17.4
2. Pasture land total	20.1	21.9
a. Plowable pasture	58.9	56.2
b. Woodland pasture	21.0	21.4
c. Other pasture	20.2	22.4
3. Woodland not pastured	21.3	23.0
4. All other farm land	8.3	6.4

About half of all farm land was used for crop land and about four-fifths of the crop land was cropped or mowed for hay. It is this crop land with which we are chiefly concerned in this discussion. In 1929 this fraction of the total farm acreage produced almost sixty million dollars' worth of crops.

Pasture land constitutes about one-fifth of all farm land. Some fifty-six per cent of pasture land is plowable and permits of the possible expansion of crop acreages in times of high prices.

Acreage classified as pasture may be somewhat misleading. Much of the land is classified furnishes a very little pasture. It is little more than waste land over which a few livestock roam in the hope of finding a mouthful of grass here and there. Much of it could be made into really good pasture that would make a lot of cheap meat and milk.

A comparison of the acreage percentages for 1924 and 1929 in Table 1 shows that there was little change in the uses of land over the 5-year period included. A continuation of the present depression will doubtless throw an appre-

ciable part of the crop land into the pasture division. The poorest crop land naturally will be first to be given up.

State Acreage and Value of Crops

In order to demonstrate the importance of the several types of crops to the farmers of Maryland Table 2 has been prepared.

Table 2—Use of Plowable Land in Maryland in 1929 with Farm Value of Crops Based on an Average for 1925-1929

	Per Cent	Value
Small grains	22.6	$14,523,000
Pasture	20.2	.....
Corn	18.7	18,883,000
Hay	7.3*	10,049,000
Truck	2.4	15,842,000
Fruits and nuts	1.2	4,805,000
Tobacco	13.7	5,697,000
All other uses	13.9	.....

* Potatoes, sweet potatoes, tomatoes, sweet corn, and vegetables for sale.

About four-fifths of all plowable farm land is devoted to uses common to general crop and livestock farming, namely, small grain, pasture, corn, and hay crops. The value of the crops concerned, exclusive of pasture, amounted to more than forty million dollars as an annual average of the period from 1925 to 1929. This sum represents about two-thirds of the total annual farm value of all crops harvested during the period named. On an average, each Maryland farm produces over 400 bushels of corn, about 200 bushels of wheat, 30 bushels of oats, 7 bushels of barley and 13 tons of hay; all of which goes to show that the major field crops have contributed enormously to the State's agricultural wealth.

Since the fall of 1929 there has been an almost continuous decline in the price of farm products. Taken as a group,

farm prices at present are only about half as high as they were in August of 1929, and only about seven-tenths as high as they were before the World War. For November, 1931, grain prices were only 57 per cent of their pre-war value while fruit and vegetable prices were 68 per cent of their pre-war value. A long-continued difference in the relative value of crops will doubtless bring about a shift in acreage from one crop to another. Probably the main effect, however, of the depression with regard to acreage will be the increase of pasture acreage at the expense of crop land.

Regional Use of Plowable Land

In order to show the regional use of crop land in Maryland, the State has been divided into six regions partly on the basis of type of farming and partly on the basis of geographical location. The mountain region is composed of Allegany and Garrett counties; the mountain valley region, of Frederick and Washington; Piedmont region, of Baltimore, Carroll, Cecil, Harford, Howard, Montgomery; Southern Maryland, of Anne Arundel, Calvert, Charles, Prince George's, St. Mary's; north Eastern Shore, of Caroline, Kent, Queen Anne's, Talbot; south Eastern Shore, of Dorchester, Somerset, Wicomico, and Worcester.

Table 3 gives the proportion of plowable land in the several types of crops in 1929 for the State and its six regions.

Table 3—Percentages of Plowable Land Used for Several Types of Crops in 1929

Region	Corn	S. Grain	Hay	Pasture	Truck*
Maryland	18.7	22.6	13.9	20.2	8.5
Mountain Region	9.0	13.8	27.1	27.4	2.7
Mt. Valley Region	20.6	31.5	17.3	16.7	3.0
Piedmont Region	16.9	23.4	19.3	20.8	7.5
S. Maryland	16.1	7.1	5.3	28.3	11.6
N. Eastern Shore	18.5	31.1	9.1	21.2	8.0
S. Eastern Shore	23.8	12.7	8.7	9.1	16.8

*Includes potatoes, sweet potatoes, sweet corn, tomatoes, vegetables for sale and tobacco.

In 1929 the small grains including wheat, rye, oats and barley occupied 22.6 per cent of plowable land more of the State's crop acreage than any other group of crops. It led in three of the State's agricultural regions, namely, Mountain Valley (31.5), Piedmont (23.4), and N. Eastern Shore (31.1). Talbot county with 34.6 per cent of its crop acreage in wheat leads all other counties. Barley, oats and rye as a group predominated in the mountain region where Garrett county leads with 13.4 per cent of its acreage in these crops.

About 19 per cent of plowable land in the State was in corn. The southern Shore counties (23.8 per cent) closely followed by Frederick and Washington counties led in intensity of corn production. Worcester county was ahead with 34 per cent. Due to the short rotations and double cropping incident to trucking in the lower Shore counties together with the absence of other feed crops, corn is of great importance in this region.

Hay acreage is most concentrated in the mountain region and least concentrated in Southern Maryland where acreage listed by the census as pasture represents 28.3 per cent of all plow land, a figure closely followed by the mountain counties. The S. Eastern Shore has relatively little of its land in either hay or pasture and about a third of its hay acreage is planted to annual legumes. Somerset county had over one-half of its hay acreage in legumes in 1929. Southern Maryland is likewise strong on annual legumes, about a fifth of its hay land being thus employed. This region also has much alfalfa and stands second to the northern Shore counties in intensity of production, where over a tenth of the hay acreage is in alfalfa. The leading county in the State is Calvert with 18.5 per cent of its hay acreage in alfalfa. But, from the standpoint of both total acreage and concentration of acreage, Baltimore county leads the State with some 3,500 acres of alfalfa.

Timothy and timothy and clover continue to be the leading types of hay in the State. Over 78 per cent of the Mary-

land hay acreage is of this kind. Frederick and Washington give a figure of 92.6 per cent.

On the basis of proportion of plowable land used, the southern Shore counties, as a group, easily lead all other regions for truck crops including white potatoes, sweet potatoes, tomatoes, sweet corn, and vegetables for sale. Dorchester county leads in tomatoes and vegetables for sale; Worcester, in white potatoes; and Harford of the Piedmont region, in sweet corn.

Southern Maryland produces most of the tobacco in the State. In 1929, 7.5 per cent of its plow land was in tobacco. A small amount was produced in the Piedmont counties. The total State acreage in 1929 was 32,974 and the estimate for 1931 shows an increase to 38,000. In 1929 the price was 28 cents per pound. The drop to 24 cents in 1931 is not commensurate with the drop in the price of most other farm products.

From Table 3 it can be seen that corn, small grain, and hay account for at least one-half of all land fit for the plow in all regions except Southern Maryland and the south Shore. They are of least importance in the former region where they represent a little less than a third of the acreage. The high proportion of small grain land in the mountain valley and north Shore regions shows the importance of grain crops, especially wheat in those regions.

Yield Trends of the Cereal Crops

Acre yields of corn and the small grains have been gradually increasing during the last 40 years. Corn and oats are producing about 10 bushels more than at the beginning of the period. Barley closely parallels oats. Wheat and rye have made substantial increases of around 3 bushels.

This rise in yield can be attributed to better farm practices such as better preparation of land, better seed, more fertilizer and manure, crop rotation, etc. Another possi-

ble factor is the use of land adapted to the crop made possibly by reduction in acreage.

Table 4 gives the average yield per acre in Maryland for the cereal crops over a period of 10 years. Because of the drought, 1930 was omitted. In that year corn yielded only 13.5 bushels per acre or about a third of a normal yield. Hay was also poor, but the small grains being little affected by the drought all made good yields.

Table 4—Average Yield Per Acre of Cereal Crops in Maryland from 1921 to 1931 with 1930 omitted

	Bushels	Pounds	Lbs.	Digestible Nutrients
Corn	38.4	2,150	1,720	(80.0 per cent)
Barley	32.0	1,536	1,220	(79.4 per cent)
Oats	30.9	989	696	(70.4 per cent)
Wheat	18.6	1,116	886	(79.5 per cent)
Rye	15.8	885	717	(81.0 per cent)

Corn produces more pounds of grain and digestible nutri ents than any of the other cereals. Barley produces about three-fourths as much grain and digestible nutrient as does corn. Wheat is second, oats third and rye last. There is little wonder that corn has such a high standing as a feed crop especially when labor for cultivation is plentiful.

Trends in the Acreage of Cereals and Hay

In answer to the question of what is happening to field crop acreages during the present depression, the estimated acreages for the cereal crops and hay for 1929, 1930 and 1931 are given below.

Table 5—Thousands of Acres in Cereals and Hay

	Corn	Wheat	Barley	Oats	Rye	Hay
1929	499	506	10	47	19	372
1930	508	481	12	49	19	369
1931	545	404	16	67	21	381

Since 1929 the corn acreage has increased each year until at the end of 1931 the net increase for the State amounts to 46,000 acres. Most of this increase is due to the relatively favorable price of corn compared to that of wheat. The 1930 drought ruined the corn crop of that year permitting a yield only one-third of normal. At the same time, due to a world surplus of wheat, the December 1 price of wheat in 1930 was 77 cents, while that of corn was 93 cents. At the end of 1931 prices stood respectively 52 cents and 40 cents per bushel. Many farmers concluded accordingly that with the high price of corn together with its higher acre yield it would pay to put corn on some of the wheat acreage.

Wheat has long been the most important cash crop for the general farmer in Maryland. The ten million dollars annually from this grain has kept many farmers on their feet in past years. There is little wonder that the present slump in wheat prices, even below pre-war figures, is bringing groans from the hills and valleys of Maryland.

The greatest wheat acreage for the State within the last forty years occurred during the period 1901-1905. Since then the acreage has been declining with the exception of the war period, 1916-1920, when it took a brief rise. From 1920 to 1929 it closely paralleled corn. But since 1929 the divergence between the acreage trends for corn and wheat has been getting greater. Corn is rising at the expense of wheat. The 1930 wheat acreage was estimated at 481,000 or 25,000 less than that of 1929. In 1931 it lost 77,000 acres, and according to current estimates is to lose another ten per cent in 1932.

Obviously, the low price of wheat is playing a big part in bringing about abandonment. The drought of 1930, however, has also played a big part. Because of late dry seeding in the fall of 1930 followed by poor appearance in the spring of 1931, a considerable acreage was replanted to corn, oats or annual legumes to take care of the feed shortage.

Corn has not been the only crop which has increased in acreage since 1929 when the index of farm prices started down. Barley, oats, rye and hay have all increased in acreage until all but 19,000 of the 102,000 acres lost by wheat have been utilized by other cereals and hay. These crops made their big gains in 1931 as a result of the 1930 drought. Oats led with an increase of 18,000 acres. Hay followed with 12,000, barley with 4,000, and rye with 2,000 acres. Some of this acreage, doubtless, will be lost with normal corn and hay production. The gain in hay acreage was contributed by alfalfa, small grains, annual legumes and miscellaneous hay crops. The 1931 timothy and clover acreage was 12,000 acres less than the 1930 acreage.

Alfalfa had an acreage of 12,000 in 1919 and 27,000 in 1931. Its quality and yield is impressing more and more farmers, especially dairymen. Its yield for the State averages 2.4 tons as compared 1.4 tons for timothy and clover mixed. Part of this superiority, doubtless, is due to the fact that alfalfa is usually grown on good land and well cared for.

It would seem that the barley acreage should grow. From the standopint of grain production and yield of digestible nutrients per acre it appears that barley is superior in Maryland to oats as a feed for most livestock. Oats is favored by a better straw and the fact that most of the crop is planted in the spring, when the farmer is not rushed as he is in the fall. The barbed awns on the better yielding barleys are also very objectionable because of the discomfort they cause both men and animals. The Maryland Station is endeavoring to breed a strain of barley which will have smooth awns or beards making it as easy to handle as bearded wheat.

In conclusion, it may be said that acreage statistics indicate that there is some adjustment going on among the important field crops of the State. Corn, oats and barley seem to be gaining at the expense of wheat. If corrections for the drought of 1930 be made, it is doubtful whether more

than two per cent of the crop acreage has gone out of cultivation during the years of 1930 and 1931. At any rate, farmers may be relied upon to make such changes as experience proves economical.

SECRETARY'S REPORT

STATE CORN SHOW

The State Corn Show was held as usual in connection with these meetings. The total number of entries of corn was 141 as compared to 109 the year before. There were four exhibits of soy beans and the potato show, held in connection with the corn show but which was sponsored by the Maryland Vegetable Growers' Association had a total of 20 fine exhibits of potatoes, both early and late varieties.

The number of exhibits in each class was as follows:

Class	I. Reid's Yellow Dent Corn	26 entries
"	II. White Dent Corn	20 entries
"	III. Golden Queen	18 entries
"	IV. Other varieties of Yellow Dent	16 entries
"	V. White Cap Corn	8 entries
"	VI. Single Ears (any variety)	42 entries
"	VII. For Juniors (any variety)	11 entries
"	VIII. Soybeans	4 entries

In every class, the corn displays were of unusual excellence this year. It created unusual interest and was closely examined by many farmers. The judging was done by Professor George Schuster, agronomist of the University of Delaware, and Professor Geary Eppley, of the University of Maryland.

Awards

The Grand Sweepstakes ribbon and the Association trophy, consisting of a silver water pitcher was won by John S. Ward of Leesburg, Virginia.

The sweepstakes' winner for the white corn was Ira V. McKenzie, of Cumberland, while the sweepstakes for yellow corn was won by John S. Ward, who also won the Grand Sweepstakes as mentioned above.

The following is a complete list of the winners of the 1932 State Corn Show.

Class I—Reid's Yellow Dent Corn

1st place—John S. Ward, Leesburg, Va.
2nd " —Smith Ward, Leesburg, Va.
3rd " —B. A. Rucker, Delaplane, Va.
4th " —T. E. Zimmerman, Frederick, Md.
5th " —Ira V. McKenzie, Cumberland, Md.
6th " —Roland Davis, Street, Md.
7th " —H. R. Tiffany, Leesburg, Va.
8th " —C. D. Neff, Leesburg, Va.
9th " —M. C. Zimmerman, Frederick, Md.
10th " —Marion Prough, Sykesville, Md.

Class II—White Dent Corn

1st place—Ira V. McKenzie, Cumberland, Md.
2nd " —A. Morris Love, Purcellville, Va.
3rd " —Billy McKenzie, Cumberland, Md.
4th " —Fred Jones, Darlington, Md.
5th " —B. A. Tucker, Delaplane, Va.
6th " —E. B. Milburn, Elkton, Md.
7th " —William Goldsworthy, Longs, Md.
8th " —M. V. Goldsworthy, Longs, Md.
9th " —H. A. McKenzie, Cumberland, Md.
10th " —J. F. Lupo, Sparks, Md.

Class III—Golden Queen and Similar Types

1st place—Norma Warehime, Westminster, Md.
2nd " —Lydia Arbaugh, Westminster, Md.
3rd " —Walter Warehime, Westminster, Md.
4th " —David Spencer, Walkersville, Md.
5th " —John E. Crum, Walkersville, Md.
6th " —Harry B. Layer, Walkersville, Md.
7th " —Noah Arbaugh, Westminister, Md.
8th " —Denton Warehime, Westminster, Md.
9th " —Eleanor Galt, Westminster, Md.
10th " —Granville Arbaugh, Westminster, Md.

Class IV—Other Varieties of Yellow Dent Corn

1st place—George Tracy, Westminster, Md.
2nd " —F. Grove, Westminster, Md.
3rd " —Ira V. McKenzie, Cumberland, Md.
4th " —H. A. McKenzie, Cumberland, Md.
5th " —Walter Warehime, Westminster, Md.
6th " —Helen Tracy, Westminster, Md.
7th " —M. V. Goldsworthy, Longs, Md.
8th " —Denton Warehime, Westminster, Md.
9th " —Eleanor Galt, Westminster, Md.
10th " —Leila Tracy, Westminster, Md.

Class V—White Cap Corn

1st place—Ira V. McKenzie, Cumberland, Md.
2nd " —M. V. Goldsworthy, Longs, Md.
3rd " —Billy McKenzie, Cumberland, Md.
4th " —H. A. McKenzie, Cumberland, Md.
5th " —G. Brooks Ward, Jarrettsville, Md.
6th " —J. E. Crum, Walkersville, Md.
7th " —Mellor K. Ward, Jarrettsville, Md.

Class VI—Single Ears, Any Variety

1st place—Fred Jones, Darlington, Md.
2nd " —Roland Davis, Street, Md.
3rd " —Smith Ward, Leesburg, Va.
4th " —Marion Prough, Sykesville, Md.
5th " —Billy McKenzie, Cumberland, Md.
6th " —Billy McKenzie, Cumberland, Md.
7th " —M. E. Zimmerman, Frederick, Md.

Class VII—(Juniors) Any Variety

1st place—R. E. Zimmerman, Frederick, Md.
2nd " —M. C. Zimmerman, Frederick, Md.
3rd " —Charles Albright, Reisterstown, Md.
4th " —Morris Crew, Jr., Galena, Md.
5th " —Dorsey Harding, Cambridge, Md.
6th " —J. Edgar Grubb, Poolesville, Md.
7th " —Dorsey McLean, West Friendship, Md.
8th " —Bertram B. Wiley, Jarrettsville, Md.
9th " —T. Guy Nichols, Clarksville, Md.
10th " —Joseph Sprinkle, Reisterstown, Md.

Class VIII—Soybeans

1st place—J. G. Stevens, Creagerstown, Md.
2nd " —M. V. Goldsworthy, Longs, Md.
3rd " —Ira V. McKenzie, Cumberland, Md.
4th " —H. A. McKenzie, Cumberland, Md.

Officers for 1932

At the business meeting held at the close of the Thursday meeting the following officers were elected:

President—Noah Arbaugh, Westminster, Md.
Vice-President—Dan Pearce, Sparks, Md.
Secretary-Treasurer—F. W. Oldenburg, College Park, Maryland.

Mr. Arbaugh was also delegated to represent the Association as a member of the executive committee of the State Farm Bureau Federation and Dan Pearce of Sparks to

represent the Association on the board of directors of the Agricultural Corporation of Maryland.

TREASURER'S REPORT, MARYLAND CROP IMPROVEMENT ASSOCIATION

January 1, to December 31, 1931

RECEIPTS

Balance, January 1, 1931	$ 48.92
Checks outstanding previous to 1931	3.00
Check outstanding, 1931	1.00
Membership dues	47.00
Appropriation Agricultural Society	267.44
	$367.36

EXPENDITURES

F. W. Oldenburg, labor at Corn Show and hotel expenses for Judge	$ 6.50
Torsch and Frantz, ribbons for Corn Show	12.44
Hennegan-Bates Co., trophy for 1930 Corn Show	17.00
Keystone Printing Company, printing of premium lists, entry tags and membership cards	31.50
Maryland Farm Bureau Membership dues	20.00
M. T. Johnson, stamps for membership	1.50
Keystone Printing Company, letterheads and envelopes	8.75
Premiums	230.00
Woodward & Lothrop, Ass'n Trophy for 1931 Corn Show	17.50
Cash in bank, December 31, 1931	22.17
	$367.36

Baltimore, Md., January 6, 1932.

We, the undersigned, have examined the books of the Treasurer of the Maryland Crop Improvement Association and have found them correct.

Auditing Committee,
CHARLES T. COCKEY, JR.,
W. C. ROHDE.

REPORT

OF THE

Twenty-Third Annual Meeting

OF THE

Maryland State Beekeepers' Association

Lord Baltimore Hotel

January 6, 1932

BALTIMORE, MARYLAND

The twenty-third annual meeting of the Maryland State Beekeepers' Association was called to order by the President, A. Howard Johnson, at the Lord Baltimore Hotel, January 6, 1932.

The President's annual address, delivered by Mr. Johnson, reviewed the activities of the association for the year. Particular mention was made of the work done by the members in co-operation with the Extension Service of the University of Maryland in assuring the success of the fair exhibits, the National Honey Week program and the Association's numerous meetings.

There followed the Secretary-Treasurer's report for the year. The Secretary recommended that the fiscal year be changed from November to begin January 1. This recommendation was put in the form of a motion, and was carried.

The Secretary was directed to send a resolution to the George Washington Bicentennial Commission endorsing the purpose of the celebration.

The program continued with a talk by Mr. George J. Abrams, Extension Service, University of Maryland, entitled "Increasing Honey Sales." Mr. Abrams urged the keekeepers to develop their local trade through personal sales and to make use of every agency, however small, in advertising honey.

There followed an interesting talk by W. J. Nolan, U. S. Bee Culture Laboratory.

Mr. W. C. Cary, A. I. Root Company, addressed the assemblage in regard to his experiences in fruit pollination work in Virginia. This talk stimulated much interest and discussion.

Mr. Abrams provided entertainment, with Mr. Wesley Parrish playing new and old songs on the piano.

Election of officers was postponed to the next meeting.

No date was set for the next meeting.

ANNUAL ADDRESS BY THE PRESIDENT

A. HOWARD JOHNSON,

Centerville.

Fellow-Beekeepers:

Since our last annual meeting, at which time your officers were re-elected to serve another year, I feel that we have made a few strides forward, with the help and co-operation of the members of the Association.

At that time you were told that our program for 1931 had been recognized by the officials in charge as worthy and that it would be included in the State budget under the Extension Service supervision.

When the State Legislature met and the Governor was presented the final request and bequests of Maryland University and the Extension Service, we found that our little request had become lost in the mass of demands made and had been sliced from the plans.

We immediately got busy and began to play the game as it was being played against us. In addition to having the members write to the Governor, I asked Dr. Abercrombie, Lloyd Shearman and Martin Voss to act with me and to go to Annapolis. Every one of them agreed to be there when needed. We did not have to go to the Legislature with our request, because we had a "real friend" behind the scenes. Mainly through the influence of the State Senator from Queen Anne's county, Hon. Dudley G. Roe, the Governor included in his emergency budget to the Legislature the sum of fifteen hundred dollars to be used for the beekeeping industry. This amount was appropriated for a term of two years and today we have Mr. Abrams on the job in the varied interests of the industry in Maryland.

Regular meetings have been held by the Association during the year with a real interest exhibited by a growing number of beekeepers in attendance.

The June meeting was held at the United States Bee Culture Laboratory at Somerset, Maryland, where we were the guests of Mr. Hambleton and the laboratory force. As usual we were royally treated and our annual visit always proves interesting and instructive.

In July your President was delighted to have the Association hold a field meeting on the Eastern Shore. The meeting was held on the lawn of the farm of Captain F. Bennett Carter, near Centerville, Queen Anne's County. More than one hundred were in attendance, and the speaker was Dr. George Rea of Reynoldsville, Pennsylvania, who spoke on "The Pollination of Fruit with Honey Bees" and "Package Bees on the Eastern Shore."

This meeting was held in co-operation with the Extension Service, and the following county agents assisted with the arrangements and were in attendance: Grubb, Queen Anne's County; Brown, Talbot County; McVean, Kent County; McKnight, Dorchester County; Evans, Caroline County.

State Senator Roe welcomed the visitors to the county. S. Charles Walls, editor of the Centerville *Observer,* ex-

tended the welcome for the town of Centerville, and Ernest Grubb for the Extension Service.

A great deal of publicity was given the industry in connection with this meeting. All of the Eastern Shore newspapers carried notices before the meeting and accounts afterwards, due to the activity of the county agents.

The Philadelphia *Bulletin* sent a special photographer for the Bee Catching Contest and *Gleanings* had Mr. Babcock present.

It was a red-letter day for Eastern Shore beekeepers and practically every county was represented. We were also happy to have a number of our friends from the United States Bee Culture Laboratory with us. I suspect that Burnside felt like he had been among wicked bees after pitching horseshoes all day.

In August Mr. Charles Baile of Sykesville was the host to the Association. I was sorry not to attend. We were packing sugar corn, and with a canning house running full blast I had to forego this meeting, but the reports were most pleasing, and I am sure that all who did attend were well paid for their trip.

The September meeting was held in connection with the Timonium Fair, and again your President was unable to attend. I was there on Sunday before the fair opened and was well pleased with the number and quality of the exhibits.

October and November meetings were held at the Hotel Rennert in Baltimore, with worthwhile programs at both meetings.

The Maryland beekeepers sponsored the first exhibit of "Honey and Bees" ever held at the Kent-Sussex Fair at Harrington, Delaware, the first week in August. Through the efforts of this Association premiums were offered by the Kent-Sussex Fair Association equal to the amounts given at our own State Fair at Timonium. The exhibit was well worth the trouble. The fair officials gave us a fine space in the brand-new Agricultural Building, and we were told

that this exhibit drew more people than any other on the grounds.—We had pictures taken and one of them will be included in the 1932 Fair Catalogue. Very few of the Eastern Shore beekeepers took advantage of the real advertising afforded. We sold some honey and have had repeated orders from one of the side show operators, who feeds honey as a special treat to his bears.

The Timonium Fair exhibits were in charge of Mr. Abrams, who spent the week of the fair there. We were given additional space in another building this year. It was much nicer and the exhibits were in a much better condition than heretofore. This was the best show we have had for several years, and Mr. Abrams deserves the full credit. We thank the individual exhibitors and hope that they received the advertising they deserved.

We had more exhibits and more exhibitors. This is as it should be, as Timonium is our official State Fair and its location near Baltimore reaches a maximum number of people. Timonium Fair on the Western Shore and Harrington Fair on the Eastern Shore as the State fairs, and with the large number of county fairs we should keep the public "honey conscious" at all times.

The year from a honey production standpoint was fine, but the product has moved slowly due to the lack of funds with a great many of the honey-eating customers. But the east and southeast sections of the country seem to have had much larger yields than other parts of the United States, and I feel sure that the surplus will all be used up before another honey flow.

On the Eastern Shore we had very little clover honey, only from the sweet clover, but our late flow from heartsease and the asters filled the suppers to overflowing. My best yield was from a little yard of four colonies, from which I extracted 385 pounds of beautiful light amber honey.

Our yield all over, spring count, was 67 pounds extracted honey.

Maryland beekeepers participated this year in the National Honey Week program, both individually and as an Association in a way which was gratifying to your officers. Every county-seat in Maryland had one or more exhibits, and most towns of 500 inhabitants had exhibits.

Newspapers carried the story of honey and George Abrams told the honey story over the radio.

The A. & P. Stores Company made a special effort to have their stores co-operate (not only in Maryland, but everywhere). Their weekly radio broadcast was dedicated to Honey Week, and in Maryland every manager was written a letter and told to exhibit honey on the counters, and if they did not have honey in the store to ask some local honey producer to make an exhibit.

The Association with the co-operation of Maryland University had suitable signs made which were used in the different exhibits throughout the State.

While we function as a State organization, yet we are far from being a State association. Most of our active members are located in the neighborhood of the City of Baltimore, and most of our monthly meetings are more or less of a local (Baltimore) interest. This is not as it should be. I believe in the local meetings and they should be held more extensively, and I think that with the aid of the Extension Service that George Abrams will be able to have more county assistance from the county agents, which will bring more of the county beekeepers together.

An Association movement is a forward movement that cannot possibly afford to remain stationary, otherwise it ceases to exist. Every member is under moral obligation to enlighten other beekeepers known to him and to secure their membership. A hearty welcome is extended to all interested in the program of beekeeping.

Every one interested in beekeeping in Maryland and anxious to make beekeeping one of Maryland's leading assets should become a member of this Association. Encourage your friends to join. Every member get a member.

Instead of sending notices of meetings, I suggest sending a report to the membership after each meeting, telling them about the program given, and our hopes and plans, and asking comments and criticisms. Let's tell them at that time the date of the next meeting. I was told that if we did this that we would have fewer at the next meeting, as they would forget in the meantime the next date. But I do not agree, for I think that they would become interested and note the next date and they themselves would try to be present.

We have Mr. Abrams as a full-time Extension worker in apiculture, and to make his work worthwhile it will be necessary that he have full co-operation and the confidence of every beekeeper in Maryland, not only to forward the work in Maryland, but without this help we cannot hope to have a continuance of State aid for the industry. I hope that when our report is rendered by the Extension Service to the Governor it will be so convincing that a larger sum will be allotted for beekeeping in Maryland.

I want to thank each and every member for the assistance they have given me during my term in office, and I ask the same co-operation for my successor. Especially do I wish to commend Dr. Cory, our Secretary, and George Abrams for their untiring interest and help in Association work and the industry in Maryland.

Here's my wish for 1932: A State-wide organization for the service of modern apiculture, designed to benefit beekeepers in Maryland, and to promote co-operative efforts and to help all interests of the industry, and that 1932 will be kind to all beekeepers in Maryland.

REPORT OF THE SECRETARY-TREASURER

By ERNEST N. CORY, College Park.

The Beekeepers' Association has had one of its most successful years from the standpoint of organization effort

and accomplishment. The annual meeting and the three field meetings, in addition to the winter meetings in Baltimore, were well attended. This was particularly true for the field meetings at Somerset, where the staff of the office of bee culture furnished an exceedingly attractive program of talks, supplemented by contests of various sorts, and the Centreville meeting, where the trip through the Raskob estate, the contests and the trip to Howard Johnson's outyards were the features.

The fair exhibits proved to be better this year than heretofore. New space in the club house at Timonium gave opportunity for a better display and the beekeepers showed the best exhibit of honey we have had in many years. Your secretary did not attend the Harrington Fair or the Belair Fair, but I am reliably informed by the assistant secretary that the Harrington Fair was particularly well attended, the exhibit excellent, and the whole spirit one that was conducive to the best interests of beekeeping.

Mr. Abrams has been employed during the past year on full time in the Extension Service. His major problems this year were the marketing of honey, organization work and educational work among beekeepers on bee diseases. The honey market survey developed some interesting facts that will be checked again this year to determine the effect of the general depression.

The Beekeepers' Association and the Home Economics Department of the Extension Service ably co-operated with the American Honey Institute in National Honey Week. A circular, "Maryland Honey in the Daily Diet," was prepared by the Home Economics section in collaboration with the Department of Entomology. There were 52 displays during National Honey Week, for which uniform posters were made available by the Extension Service. Mr. Abrams broadcasted a radio message during National Honey Week, and likewise gave two other radio broadcasts during the year.

A disease survey in seven counties revealed one-third of

the apiaries and 10 per cent. of the colonies infected with American foulbrood. Many minor problems in beekeeping have been tackled this year, but the foregoing reports the principal activities.

FINANCIAL STATEMENT

January 6, 1932

On hand in bank January 7, 1931	$29.91
Deposits by dues	46.00
Journal money collected (not deposited)	9.00
Total	$84.91

EXPENDITURES.

Jan. 12—G. J. Abrams, expenses at annual meeting	$7.50
Jan. 14—E. L. Seichrist, expenses at annual meeting.	3.12
April 29—A. H. Johnson, honey for Rennert Hotel	13.79
June 22—G. J. Abrams, two queens for field meeting.	2.20
July 2—University Press, membership cards	3.75
July 25—George H. Rea, expenses at meeting	14.83
Aug. 3—George H. Rea, honorarium	5.00
Subscriptions to American Bee Journal (cash)	9.00
Total	59.19
Balance January 6, 1932	$25.72

INCREASING HONEY SALES

GEORGE J. ABRAMS.

The subject of "Increasing Honey Sales" is more or less a delicate subject to deal with, because we all of us have had some experience in selling honey, and we all have our own ideas about the honey market. From the standpoint of the man who makes his living or a goodly portion of it,

producing and selling honey, this subject holds more interest than any other, and for this reason alone it behooves the one discussing the subject to watch his step, because, to suggest a procedure that may have proven a success for one man, may have turned out a failure in the hands of another.

The honey industry may be conveniently divided into four parts: namely, Production, Packaging, Advertising and Selling.

There is very little that can be said about anyone of these four phases of the industry that would be really new. So much has been said and written, and so much thought has been put on the various problems concerned with Production, Packaging, Advertising and Selling that it is most difficult to say or think of something really new and original, and the best that one can hope to do is to resuggest and emphasize some of the sounder ideas which have been advanced.

The subject of production has received the most attention at our meetings in the past and the members of this association certainly know what is expected of them in the matter of properly packaging their product, so let us focus our thought on the other two phases of our industry; namely, Selling and Advertising.

From the standpoint of time, thought and labor involved, the simplest and easiest method of disposing of a honey crop is to place it in the hands of a commission man or wholesaler and let him slowly dispose of it. By this method the producer exhibits little or no initiative, ingenuity or industry in disposing of his crop and for having done so little toward marketing it, he must be satisfied with a very narrow margin of profit because, of course, the wholesaler and later the retailer must make their profit.

The second easiest method of disposing of a honey crop, from the standpoint of time, thought and labor involved, is to place it directly in a retail store. This method requires some salesmanship because, of course, the store manager must be won over to the idea of handling honey. However,

the actual retailing of the honey is taken off of the producers hands and in doing this he loses the money made by the storekeeper for his trouble. In this method of selling, the beekeepers' margin of profit is small and the honey usually moves slowly because the man selling honey and making the contacts with the consumer is not particularly interested in honey and is certainly not qualified to offer intelligent sales talk.

You may well wonder then what method of selling we are to pursue if we are to increase our sales. I believe that the best and most profitable method of selling honey today is through developing your own local trade and by making personal sales.

Before the war this method of selling was used more than at anytime since. With the coming of the war higher prices and increased production caused the pendulum to swing the other way and it was found that honey could be handled with profit for all, by honey dealers, not producers. However, I believe the pendulum has made its backward swing and that under present conditions, honey can best be sold and at a greater profit by the beekeeper himself through house to house peddling and through the building up of a personal trade.

It may be well to explain what I mean by a personal trade. By personal trade I mean a group of individuals who are frequent or regular users of honey, to whom you sell direct, either by peddling or by taking orders and delivering in person or by mail.

I think that beekeepers have only scratched the surface in their attempts at moving their crops locally and personally. I believe that by starting with ones relatives, friends and neighbors as a nucleus it is possible to gradually build up a worthwhile trade. By showing a little consideration of and friendliness for neighboring beekeepers and through co-operation with them there should be no trouble from price cutting. There are so many potential honey users that there should be no trouble from over-working a locality.

It is probably true that each of you have a list of customers, but I venture to say that, with a little effort on your part, that list could be greatly lengthened.

There are several points I wish you would consider in thinking about honey peddling and the building up of your own personal honey market.

In the first place there is the matter of profit. The beekeeper gets the retail price for his honey and the profits are split with no one.

In the second place, by dealing directly with the consumer the beekeeper has the opportunity of really selling the idea of honey to his trade. He is the enthusiast; he is the best qualified to talk honey and can do infinitely more to stimulate first sales and repeat sales than a storekeeper who sells hundreds of articles, and therefore, cannot possibly be as interested in honey or know as much about it as the beekeeper. Should a storekeeper become a convert to honey, and should he become thoroughly qualified to discuss honey with his customers, he seldom would have the time to devote to such missionary work.

Thirdly, by having a personal trade it can be studied for better methods of serving it and keeping it regularly supplied. He can see to it that his trade is never glutted or neglected, two marketing evils of equal rank. Whereas, the storekeeper would do well to know by sight the faces of his best honey customers, the beekeeper has an opportunity to become friends with all of his customers, thus steadily increasing their confidence in him and his product. By keeping notes on each customer he may know just about the time to make a visit or write in regard to replenishing the customers supply.

Probably one of the most important features of this type of selling is that the consumer buys with more confidence. It has been a number of years since the Pure Food Law was enacted and forbid the tampering with honey, yet the old spectre of adulteration still persists. Many people are still skeptical. They do not understand how so much honey can

be placed on the market and at such a low price without its having been adulterated with cheap sugars. This skepticism is still one of the biggest drawbacks to the beekeeping industry.

However, even the most wary individual could soon be won over by a man who sells with enthusiasm a product which he himself has produced, and who leaves each customer with a standing invitation to "come out on Sunday and see how the bees make honey."

It is true that the building up of this sort of business takes time and infinitely more ingenuity than merely selling through a store; however, the profit is greater and the number of sales larger. Also this form of marketing requires of the producer that extra quality of salesmanship, which it is true many men do not possess. Maybe it is asking too much of a man that he be master of both the production and sales ends of his business. However, at the present time and with the present degree of organization of the industry that is just what the successful beekeeper has got to be.

The successful salesman must have personality, good appearance, experience in selling and above all, enthusiasm and a real knowledge of the product he is selling. Possibly you are not suited by disposition or personality to be a successful salesman. If this be true, you cannot hope to make a success of selling. Possibly you have not the time because of other enterprises to give your honey business your best thought and effort. If this is the case, you cannot rightfully blame honey. There is nothing wrong with the honey business that cannot be remedied, and the fact is as true today as it ever was that there are men who, by their energy and ingenuity, do move each year's crop and realize their entire livelihood or a fine auxiliary income from the sale thereof.

As to the advertising end of your business you are up against the same proposition that the honey industry as a whole has to face. We are all agreed that if honey could

be nationally advertised on billboards, in magazines and over the radio, it would sell as well as any food that is not a necessary, staple article of the average diet. However, such advertising is too expensive for the beekeeping industry at present and the best we can do is to do our own local advertising and keep in mind the stock phrase of the experienced advertising specialist that "in advertising there are no factors of minor importance"; then, through every agency in our power, if it is no more than through the exercise of our vocal chords, let everyone in our locality know the uses and virtues of honey and where it can be purchased.

It may be well to consider the following simple questions with regard to local advertising:

1. Have you outlined a definite plan for marketing your honey, including ways of advertising which are available under your particular conditions?

2. Have you an up-to-date list of consumers and do you systematically and periodically visit or circularize the families on this list?

3. Have you placed "Honey for Sale" signs on your property, and are they prominently placed and large enough to be read from a distance?

4. Have you placed the Government "It's All Good Honey" sign in your local postoffice, railroad station, drug store, etc?

5. If you use a truck in your business, do you have it appropriately lettered?

6. Have you talked with the editor of your local paper in regard to printing articles about bees and honey and honey receipts?

7. Have you talked to the principle and athletic director of your local graded and high school in regard to honey for growing children and as a sustaining article of diet for athletes?

8. Have you talked with your local confectioner and baker about honey receipts?

9. Do you give talks at local business men's meetings and women's clubs?

10. Do you place bees and honey displays in local banks, stores and lobbies of movie houses periodically?

11. Do you advertise on the screen in your neighborhood movie?

12. Have you placed several hives in your yard in plain view of the road so that people will understand that you produce the product you have for sale?

13. Have you developed a really attractive label or are you using a supply house stock label?

14. Do you have different kinds of honey for sale so that you can suit any palate?

15. There seems to be an increasing demand for chunk honey; are you taking advantage of this trend?

16. Have you tried selling granulated honey or honey butter?

To summarize: Make a real effort to sell your honey locally and directly; and remember that many small and inexpensive advertising schemes can be woven into a successful whole.

ADDRESS

C. W. CARY (A. I. ROOT CO)

It is generally recognized by all State colleges and also commercial fruit growers, that it is necessary to have bees in orchards for pollination.

In the past we have had poor sets of fruit, and lots of the fruit that did set was of inferior grade. This, we have found to be caused by lack of pollination agencies in orchards.

Now that we know that we have to have bees, the next problem is, just how are we to manage them. It has been suggested that all fruit growers must become beekeepers.

After two years study and investigation I am firmly of the opinion that fruit growers will never become beekeepers; the reason being that they do not have time to give the bees attention at the two seasons of the year when attention must be given, viz., early spring and early fall. We know that these two seasons are the fruit growers busiest time.

There are several ways that fruit growers can keep bees successfully, viz., in the case of the large grower who has operations enough, we would suggest that he employ an expert beekeeper and own his bees. In the case of smaller growers, they might club together, buy bees, and turn them over to an expert beekeeper. This beekeeper could have the bees in shape for spring, the fruit growers themselves using their trucks to move them in their orchards, and after blooming period move them out, and it would be the beekeeper's job to find a suitable location for them, preferably four or five miles from the orchard. The next step would be to rent bees from local beekeepers.

There has been a good deal written and said regarding the use of package bees. It is my opinion that in Virginia and Maryland, package bees will not be successful every year. The past spring was an ideal time for the use of package bees, and some fruit growers used them with success. I believe that in the average spring in both Maryland and Virginia, the weather will be too cold, and, as is the case in most springs, rainy, so that the fruit grower will not get results from bees in wire cages wrapped in paper.

To the fruit grower or beekeeper, we would like to make some suggestions as to the care of bees and the shape the bees should be in to be of any benefit to the fruit growers. Bees should be in the very best hives obtainable. There should be full sheets of foundation used, especially in the brood chambers, so that all bees hatched will be working bees. I recommend running colonies of bees in two-story

hives, and re-queening each fall, so that you will have good strong colonies to go into winter quarters. The top story of this two-story hive should be full of honey. The honey in this hive will not be consumed in winter, but when spring comes, if we expect the queen to lay and to build up a strong colony, there must be an abundance of food.

I am of the opinion that there should be a full-time bee specialist in fruit growing States, and his time, especially in early fall and early spring, should be spent in the fruit-growing areas of the State, so that he could advise the fruit growers who own their own bees as to their condition and care, and also advise local beekeepers, so that they could have their bees in proper condition to be of benefit to the fruit growers who rent them.

The beekeeper who rents bees to a fruit grower should be sure that the bees furnished are full strength colonies, for to furnish anything less than that he would be doing the fruit grower an injustice as well as himself. When a man pays out money and does not see results, he will not pay out money a second time for the same thing. Colonies of bees must be built up to honey gathering strength early enough for fruit bloom, to be of any benefit to fruit growers.

The past spring, in a visit to one of the prominent fruit growers in the Valley of Virginia, we found him very enthusiastic about his bees. He had just purchased fifty colonies and thought he was very well fixed for pollination. On examination of the fifty colonies purchased, we found that not one colony was strong enough for any bees to leave the hive if the weather was the least cool, so, of course, these bees were worthless so far as the orchard was concerned, as they were so short of stores as to be almost on the verge of starvation.

Now as the honey bee is of benefit to the fruit grower and beekeeper alike, I would again urge that the beekeepers and fruit growers should combine their efforts in securing a full-time specialist, for I feel sure that he will be worth the expense to the State in increased revenue.

MULTIPLE MATINGS OF QUEENBEES

By W. J. NOLAN

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The question of multiple matings of the queenbee has long been a subject of discussion among beekeepers. The material presented here was prepared in 1924 in connection with the bee-breeding program of the Laboratory, but, partly because of the author's desire to do some research work in this field, publication was delayed. With the announcement shortly afterwards of a method for the successful artificial insemination of queenbees, experimental work on the subject of multiple matings in nature has not been taken up because artificial mating offers greater possibilities for scientific breeding under controlled conditions than does natural mating and so it has been considered desirable to give full attention to it. Since, however, natural mating must still be resorted to by the commercial queen-rearer and the honey producer, the subject of multiple matings is of interest to them because of all that is involved in the question of having pure matings. Although the material presented here contains no data published since 1924, it is strictly up to date because what few items have appeared in the meantime on the subject are only in line with the others cited here from apiary experience.

That a queenbee mates only once in her lifetime and never afterwards leaves the hive except to head a swarm, was stated in the eighteenth century by Janscha, the celebrated Slovene beekeeper, called to Vienna by the Austrian Government. Most beekeepers of the present day are quite in accord with this statement, although it was made a century and a half ago. Since the time of Janscha, however, there has been such an accumulating mass of evidence on successive matings that standard, apicultural textbooks like "Beekeeping," by Phillips, and Root's "ABC and XYZ of Bee Culture," contain statements that a queen may mate more

than once, at least before laying. On the other hand, Cook in 1904, and Zander of Germany in 1913 maintained that a queen will not mate again once she has received spermatozoa from some drone.

The question is of importance from the standpoint both of the breeder and of the commercial honey producer, because, if the queen may receive a supply of sperm from two different sources, some undesirable race may gain a foothold in any well-regulated apiary. If this has occurred, it has not often been reported from commercial apiaries, possibly because the queen may mate much nearer home under ordinary conditions than is generally supposed, and hence it may be that the chances of impure matings are thus reduced to a minimum. The writer knows of one apiary in which Italian queens have apparently been purely mated, while within a half mile another apiary contained black drones. Many beekeepers have, however, had the opposite experience.

If there is more than one mating, then as regards time there are only two possibilities: (1) either all matings occur before the queen has laid a single egg, or (2) at least one or all occur after she has already laid some eggs. In case the matings all do occur before the queen has laid any eggs, then either (a) at the time of only one of the matings is sperm transferred from drone to queen, or (b) a certain quantity is transferred at the time of each successive mating. If, on the other hand, at least one of the matings come after the queen commences to lay, this means either (a) that the queen commences to lay after receiving a quantity of sperm from some drone, or else (b) that she commences to lay before any sperm is received. The latter event involves the possibility of laying before even meeting any drone.

In discussing the subject of successive matings, the anatomical and physiological possibility of such a phenomenon should be established, after which examples published from practical or experimental apiary experience may be presented. An outstanding piece of work on fer-

tilization in the honeybee, published in the United States in 1920 by Bishop (Journal of Experimental Zoölogy, XXXI, pp. 225-258; 267-286), contains important data bearing on the problem under discussion. Unfortunately, this work has received scant attention in American beekeeping literature.

As is known to most experienced beekeepers, the queenbee on mating retains for a few hours a portion of the male organs torn off when the queen and drone separate. This protrudes from the queen, and affords the first visible evidence that a drone has been met on the mating-flight. The filling of the spermatheca does not, according to Bishop, occur immediately after mating, since the sexual secretions of the drone are contained temporarily in the vagina and oviducts. These secretions are of two kinds, the spermatic fluid from the seminal vesicles, and a mucus from the accessory glands. These do not mix during mating, the spermatic fluid being ejected first and the mucus being ejected immediately afterwards, nor are they later mixed together as one when within the queen's organs. The spermatic fluid contains the spermatozoa, the active male reproductive elements, and is of a yellow color, while the mucus is white. This contrast in color makes it easy to determine the position of each secretion upon dissection of a newly-mated queen. Furthermore, the mucus possesses the peculiar property of hardening immediately upon exposure to the air.

Bishop's dissections of newly-mated queens show that the oviducts usually contain a white central core of mucus surrounded by the spermatic fluid. The spermatozoa tend to gather both along the walls of the oviducts and along the folds of the wall near the "sperm pump" connected with the spermatheca. The vagina and the remains of the male organ brought back after mating each contain only pure mucus, as might be expected from the fact that the mucus is the last secretion ejected. The mucus in the copulatory organs as soon as exposed to the air becomes so hardened as to form a plug which prevents any escape of

the spermatic fluid from the oviducts before all the spermatozoa have collected in the spermatheca. Most of the spermatozoa have entered the spermatheca within 4½ hours after mating, and practically all have entered within 6½ hours. The mucus is absorbed more slowly, but Bishop's experiments show that all traces of mating disappear from the oviducts and vagina within twenty-four hours, the ramains of the male organ so drying up and shrinking that it either becomes dislodged or is removed by the workers within a few hours.

An important fact brought out by Bishop's work is that the sperm is all within the oviducts when the queen tears free of the drone, and that it is held there, if the reproductive organs of queen and drone have functioned normally, by the continuous mass of mucus which forms a core in the oviducts, and completely fills both vagina and the remains of the male organ, the mucus becoming hardened wherever exposed to the air. Since oviducts and vagina are free of both sperm and mucus within twenty-four hours after mating, there is no anatomical reason why a queen should not mate several times, in case she receives no sperm on each previous occasion, or even if she receives some but not enough completely to fill the spermatheca. These facts quite agree with the two conditions mentioned earlier in this article as those under which sperm may be received before the queen begins to lay. Bishop's work, however, affords no evidence whether or not a queen may mate after laying.

The first published evidence as to successive matings of queenbees dates back almost to the time of Janscha, since, less than forty years after the publication of Janscha's statement, Huber recorded the fact that a queen may mate more than once. In the second edition of his book, in 1814, Huber says, "It is nevertheless indeed rare that a single mating does not suffice; in the course of our numerous experiments, we have seen only two queens requiring more than one for becoming fertile, while all others have become fertile the first time that they mated." The next account

seems to be that of Gutler, in 1857, who reported having seen a queen returning two days in succession with signs of mating. In 1860 Dzierzon observed a queen returning from a flight on the day after she had returned with signs of mating. 1867 Leuckart reported matings of a queen on two successive days. Observations by such authorities as Huber, Dzierzon and Leuckart need no comment.

In American bee-journals the first evidence of this nature was presented in 1868 by Nesbit, who saw a queen bearing signs of having mated on two successive days. In 1869, J. L. Davis, the first beekeeper in the United States to report the transferring of larvae as practical in commercial queen-rearing operations, stated that he had evidence of a queen mating with four different drones. He also noticed that after mating the queen does not fly out again before at least the next day. In the same year J. T. Langstroth reported that, "queens seen returning, or soon after return, with the plain marks of copulation were discovered, generally after three days had passed, to have *again* met the drone." Still later in the same year T. C. Hill reported that he had seen the same queen returning three times with signs of having mated. The second mating occurred five days after the first, and the third one day after the second. Henry Alley in 1869 and 1870, Chapman in 1870, O. F. Bowen and G. W. Young in 1880, all gave instances of a queen mating twice. Alley thought the first mating is not successful in such cases, while D. C. Hunt thought that every mating is successful. Both Chapman and Young found the two matings to occur on successive days.

The year 1880 was marked further by the testimony of one of the foremost American authorities, A. I. Root, who said, "I have myself seen the same queen come into the hive on different days, with the usual marks of fertilization, and our apiarist witnessed the same thing during the past week." It is noteworthy that even two years previous, the father of American beekeeping, L. L. Langstroth, had stated, "My son and myself noticed several instances in our Oxford apiary where queens certainly mated twice, and one

where a queen mated three times." He adds, however, "I never knew a queen to mate again, after it was evident from her increased size, that she had been fecundated, and was preparing to lay." Strange to say, these early observations by competent observers have been overlooked by later American commentators on this subject.

Apparently the first person to report any extended study of successive matings was E. Pierrard, of France, who, in 1881, published the first of a series of observations. Of sixteen queenbees under observation, nine commenced laying after the first mating without any attempt to fly out again, four mated twice, one being balled to death on her second return; one mated three times; and two flew out again after the first mating, one of them being frightened away on her return from her flight two days later and not returning. The other flew from the hive two days after the first mating but hurried back because of cloudiness and wind. On the third day after her first and only mating, she was found to be laying normally. There was no definite time between successive mating flights, although in most instances of double mating the second mating occurred two days after the first. In the case of the triple mating, the second mating occurred 8 days after the first and the third 24 hours after the second. In 1882 he reported another queen which mated 8 days after emergence and then again 8 days later. This queen showed a desire to fly out again on the day after the second mating. It should be noted that in all these experiments Pierrard kept the queen confined to the hive except during the periods of his observations. In 1892 he reported experiments conducted both in that year and in 1891. In the first year three queens were under observation, but each mated only once. In 1892, of five queens under observation four mated twice on two days in succession. This was somewhat contrary to his previous experience, since on all other occasions the second mating occurred not less than 48 hours after the first. The fifth queen mated only once and laid without again trying to fly out. It was his original intention to

see if this queen would lay after being prevented from flying out again if she so desired.

In 1887 Glaudeix of France wrote to the editor of the *Revue International d'Apiculture* as follows: "the queen generally mates twice. I say twice because, if she is prevented from mating a second time on the same day or the day following, the second mating can no more occur, and three or four days afterwards she commences to lay as if she had mated twice. Only in place of being a fertile queen for three or four years, she will only be so for a year and a half or two years." Devauchelle in 1888 also published observations on queens mating twice.

In the United States, in 1893, L. B. Smith added to the evidence that queens mate more than once. In the same year Fred Bechly, and in 1899 C. G. Hodge each reported seeing queens fly out and mate again on the same day soon after a previous mating. Bechly ascribed the second flight to the hostile attitude of the worker bees when the queen returned from her first flight. In 1901 Pratt stated that queens sometimes return with evidence of having met a drone three or four times in one day for two or three days. He added, "These are false contacts and are easily removed by the bees." In 1904, J. G. Baier mentioned seeing a queen return with signs of three matings in one day.

A double mating on two successive days was observed by Doctor Rohrer in 1903. In 1904, both Frank Benton and Henry Jones recorded having witnessed double matings some twenty years earlier. The minimum time between matings as observed by Benton was two days, while the maximum was nine days. A minimum and maximum of one day and 14 days respectively being reported by Jones. In 1906, L. W. Scholl reported a double mating. Such an instance was reported in the *British Bee Journal* for 1909, while in the *American Bee Journal* a year later Alex Schroeder of Austria, stated that such an occurrence was nothing new in his experience. R. F. Holtermann, in 1913, reported that G. B. Howe had experienced the same thing, while in 1920 A. C. Miller wrote that in several instances,

he knew of two matings, and on two or three occasions had noted three matings.

In 1918 there appeared the first of a series of articles on this subject by Julien de Mamers, a French missionary in Abyssinia. At that time he reported four queens which had apparently mated twice. One of these queens began laying 36 hours after the last mating. De Mamers and Pierrard are apparently the only two beekeepers who have made public the results of continued observations in this field. It was at first de Mamers' belief that Abyssinian bees must be somewhat different from those in Europe in that they mate twice. 1922 he described a queen which in 1921 mated once on each of three successive days. In each of the five cases, the queens flew out at least two days in succession, flights on four successive days being the maximum observed. In 1922 de Mamers published four articles on successive matings. In 1924 he published still another, in which he stated that of seven queens observed one mated four times, one mated three times, and the other five mated twice. From his observations he reached the conclusion that a second mating is necessary for Abyssinian queens, while a third or fourth mating is more or less dependent on other factors. He believes that the more prolific queens mate more than once. Others have advanced the same thought. In Abyssinia, moreover, when the weather is good, each successive mating occurs every 24 hours regularly. Pierard also observed this to happen on certain occasions, but not regularly. It is de Mamers' belief that the remains of the male organ can be taken as a proof only of mating and not of completed fecundation. He never saw workers trying to remove the remains of the male organs, but saw the queen trying to rub the organ off on edges of cells. Bishop's work shows that this is possible, since he found that the male organ dries and shrinks to such an extent as to be removed easily. De Mamers never found the queen flying out again on the same day after mating had occurred. Others, among them being J. L. Davis, have reported the same thing.

Of the people just cited as observing more than one mat-

ing, those of the opinion that on only one of the matings is sperm transferred far outnumber those who favor the idea of successive transfer of sperm. It is, of course, impossible to determine whether successive transfers of sperm occur, since the question could be settled only if actual dissections were possible after each mating. Langstroth believed only the last mating to be effective. Benton was of the same opinion, because in the cases under his observation the queens did not increase in size before the final mating or show any visible characteristic different from those observed before the first mating. Von Berlepsch, Cook, and others have argued that the fact that a queen clipped as soon as she returns from her first mating will remain prolific for years demonstrates that on only one occasion is sperm transferred. This evidence in itself is not sufficient, because it means only that the queen received enough sperm on the occasion of a single mating to fill the spermatheca sufficiently to last a long time. It does not mean that this is true of every case. The common idea that all except the last mating is defective in some way so that sperm does not pass into the queen might well be the case if the drone's organs were defective. The same might be the case if the drones were too young, since Bishop found that drones are not sexually mature until they are from nine to twelve days old.

Although it is not yet fully established that the queen may receive a certain quantity of sperm at each successive mating, a few observations seem to give positive evidence supporting this view. Thus Pierrard had several queens which apparently tried to mate again after the first mating but were prevented from doing so, either by weather conditions or by the obstruction which he had placed at the entrance. Nevertheless, in each instance the queen laid worker eggs. Many instances have been published of the offspring of a queen suddenly changing from one color to another. As early as 1868, Nesbit reported that he had observed the progeny of certain queens to remain one

color for several weeks, and then to change to another color for some weeks and then again to the original color. In 1922, Noirot, in France, reported an instance where a queen produced all Italian bees the first year, and during the second year after the season began there were nine blacks to one Italian. De Mamers has also reported that in Abyssinia there are two different races of bees, and that it is a common thing to see the bees change from one color the other inside a month. His most interesting observation in this regard, however, is one in which he reported having seen a red and a black bee emerge at practically the same time and only two cells apart. It is on evidence of this nature that the supporters of the idea that a queen's spermatheca becomes filled by successive matings rather than by only one must rest their case. In interpreting such data, the Mendelian law of heredity must be borne in mind constantly, since variations in color may be explained as well by laws of heredity as by successive matings.

It may be mentioned that successive operations have been made at times in the work on artificial insemination of queenbees by Watson, the writer, and others. Watson holds that such successive operations on a queen increase the degree of insemination of that queen.

Few people at the present time are of the opinion that a queen mates after once beginning to lay. Of those holding that a queen may lay a few eggs before mating Cook mentions Dzierzon, although the original publication was not found by the present author. In America in 1878 D. D. Palmer published observations stating that queens will sometimes lay a few eggs before mating. At the Cincinnati meeting of the North American Beekeepers' Society in 1880, J. P. H. Brown, the well known queen-breeder from Georgia, stated that a queen will sometimes lay a few eggs before mating. Even as late as 1906, Brunnich, of Switzerland, reported the same circumstance. Brunnich's statement was attacked by Mulet, of Germany, who claimed that all such instances are the result of the presence of laying workers. This point seems to admit of debate and more observations

are necessary because of common experience that a queen once beginning to lay before mating remains a drone layer.

Of those asserting that a queen may mate after once having begun to lay, A. I. Root stands out prominently. In 1878 he reported that an imported queen, received late in the fall and wintered without laying, showed signs of mating in the spring. In 1882 he referred to this example again and said that he had had several cases since then that seemed to indicate that a laying queen may mate again after laying worker eggs for some time. It was his belief that the queen becomes so reduced in size when not laying that she quite resembles a virgin. In the same year S. C. Fox reported that he had ordered a mated queen but that this queen had mated after her arrival. Dzierzon, in 1861, reported that he had seen a queen flying in November which had been mated and had laid since the previous September. She had been mated too late for much active brood-rearing, however, and consequently egg-production had not made her body too heavy for flight. There was little chance of meeting a drone in November, otherwise she might have mated again, according to Dzierzon. In 1904 Benton advanced the same idea advocated by A. I. Root over a quarter of century previous, when he said that a queen might fly out and mate again if she were not too heavy with eggs. Benton thought this might explain why a small nucleus sometimes swarms out for no apparent reason, since the queen, being checked in egg-laying, and reduced in size, possibly flies out to mate again and the bees go with her.

Since queens which have mated and are laying at a satisfactory rate are probably not apt to fly out, the possibility of their mating again is only of passing interest except perhaps to queen-breeders. It is of little practical importance to the commercial producer of honey, because it is well known that clipped queens will remain inside a hive for years, being so prolific during at least the first two years as to show that the rate of brood-rearing is not hindered even when the possibility of mating again is removed by

clipping the wings. In the writer's experience, more than one clipped queen has been known to be active in the same colony for three years, and in every instance to lay just as many worker eggs as did unclipped queens of the same age in the same yard. Berlepsch claims that this is possible for five years. The instances given by A. I. Root and Dzierzon are those of a queen kept from laying for several weeks in the one case, and laying at a very slow rate in the other so that the queens were sufficiently light for mating flight. If this is of regular occurrence, it would prove of special interest to queen-breeders, because an imported breeding queen, or one coming from a long distance, might mate again after receipt. Evidence during the last forty years on this special phase of successive mating is so inconclusive, however, that the case is far from proved.

Even though a wealth of evidence confirms the fact that a queen may mate more than once before commencing to lay, the reason why this takes place has not as yet been established. That it may be due to an insufficient filling of the spermatheca on the first mating seems to be brought out in the work of Pierrard and de Mamers. The conservative explanation is, of course, that no sperm is received by the queen until the last mating. From the anatomical standpoint the work of Bishop seems to offer no obstacle to either theory, since on the one hand he found oviducts and vagina at the end of twenty-four hours in the same condition as before mating, so that if the spermatheca were not filled to capacity as the result of one mating, another mating could follow. In one instance he actually found only one oviduct filled with sperm. On the other hand, since he found drones not wholly capable of functioning before the ninth to twelfth day, a chance meeting with such drones might result in the queen returning with the external signs of mating only. There may be some physiological factor, however, which permits of further flights before egg-laying begins, even though the spermatheca is already completely filled. In any event the queen does not begin egg-laying immediately upon receiving the

spermatic fluid; it is commonly held that she usually waits at least two days. During this time certain developments are doubtless in progress in the egg-laying organs, and until these are completed it may be that the queen still possesses the instinct to mate.

Some have thought that a queen flies out to mate again because the treatment she receives from the bees forces her out of the hive. It is well known that often the queen is apparently balled on returning from a mating flight. In 1858, Vogel, in Germany, described bees acting in a hostile manner towards their own queen just returning from mating. He thought the cause of such behavior could be ascribed to the odor of the drone's organs brought back by the queen, and that the hostility of the bees is probably intensified further by any odor of poison from their own stings which may be imparted to the queen under such circumstances. It is, of course, well known that the bees often try to pull away the remains of the male organs. In the United States this was described in 1904 by Baier. In 1906 Brunnich stated that he had observed queens balled for a half hour or more on their return from mating. The queen quite often received some injury from this treatment. In France, Bertault reported in 1922 having observed on several occasions a mass of bees "as large as a nut" surrounding a queen immediately on her return with signs of mating. The bees had every appearance of trying to ball her.

It scarcely seems probable that any treatment received by the queen on her return accounts for successive matings, as a general rule, because de Mamers and others expressly state that they never observed a queen flying out again on the same day on which mating occurred. The intervals between successive matings were found by de Mamers to be quite regularly one day, and by Pierrard to vary from one day to eight days. In fact, with only a few exceptions, all the reports found give an interval of at least one day or more. In all such instances it might well be that actual mating occurred in each instance because sufficient time

had elapsed for the sperm to collect in the spermatheca and for the mucus to be absorbed. Even granting that after mating the queen may fly out again on the same day because of treatment received in the colony, no further mating could take place that day because of reasons shown by Bishop's work, unless the worker bees had pulled out the remains of the male organs and the mucus plug as well, thus allowing the escape of the sperm before it had had time to collect in the spermatheca. The same thing might happen if the accessory gland of the drone did not function, or if the supply of mucus had been deficient so as to let the sperm run out, or if on the occasion of the first mating no sperm or mucus had been received. Only on such ground could any anatomical explanation be given for a queen bearing external signs of having mated with two drones in one day as claimed by Hodge and Pratt.

The following may be stated in summary:

1. It is anatomically possible for a queen to mate twice or more before laying commences.

2. The field of practical experience abounds in instances of successive matings before laying commences, there having been such witnesses as Huber, Leuckart, L. L. Langstroth, A. I. Root, as well as such special investigators as Pierrard and de Mamers, and others.

3. On anatomical grounds sucessive matings accompanied by a transfer of sperm could occur ordinarily within not less than twenty-four hours.

4. There seems to be some positive evidence that sperm is received successively from two or more males. De Mamers has made important contributions in this respect, while those of Nesbit are the earliest in the United States.

5. The few instances when a queen has been reported to have returned twice in the same day with evidence of having mated presumably signify that on the first occasion the queen did not retain sperm and mucus received or else that she received neither.

6. There have been a few reports from reliable workers of matings by queens which have already begun to lay worker eggs. A. I. Root figures prominently in this connection. More investigation is needed before forming any conclusion.

7. There have also been a few reports that a queen may lay a few eggs before even a first mating. Brunnich is mentioned in this connection. Observations in this regard have been too few to form any definite conclusion.

8. The reason for successive matings has not yet been determined.

REPORT

OF THE

Maryland Vegetable Growers' Association

Fourteenth Annual Meeting

First Session

(Joint Session with Crop Improvement Association and Tobacco Growers' Association)

January 6, 1932

BALTIMORE, MARYLAND

The joint session was called to order with J. C. Brown of the Tobacco Growers' Association presiding.

CROPPING SYSTEMS FOR THE VEGETABLE GROWER

By H. H. ZIMMERLEY, U. S. D. A., Washington, D. C.

Concomitant with the rapid changes in industrial methods and transportation facilities have come equally important changes in the vegetable producing industry. Vast development of the automotive industry during the past two decades has been probably the greatest factor affecting vegetable production. Replacement of horses and mules by the automobile, the truck and the tractor, has not only reduced the supply of stable manure but has also released many thousands of acres previously used for animal feed for use in the production of vegetable products. In the past, the market gardener or trucker in the vicinity of

large cities, because of large quantities of available stable manure and a nearby market, had a tremendous advantage over the distant producer. Keen competition is now being felt from more recently developed areas often high in virgin fertility and relatively free from the depredation of many of insects and fungous diseases which have been troublesome in the older areas.

With increased production has come the demand for improved quality in both fresh and canned vegetables. In fact, the tendency for consumption of increased quantities of vegetables to keep pace with our rapidly increasing production depends largely on the quality of product placed on our large consuming markets. Then, too, there is the added competition between the grower of fresh vegetables and the producer for canning and preserving. Each must be ever mindful of quality and price to attract the attention of the housewife who is ever alert in procuring the largest value for the dollar expended.

Many growers in Maryland and other states near the large consuming centers have modified their entire system of farming operations to meet these changing conditions. This is particularly noticeable in the canning industry as evidenced by the fact that average yield per acre of canhouse tomatoes in Maryland has increased over 50 per cent during the past decade. Improvement in quality has also kept pace with increased production. Production of high quality vegetables is generally associated with conditions conducive to rapid growth and high yields. Increased feeding of livestock and adoption of rotations including general farm crops and green manurial crops, in addition to the use of better seed and a more intelligent system of fertilization and cultivation are the principal factors which have been responsible for improvement in quality and yield.

Planning satisfactory rotation for vegetable crops, particularly for the sandy areas of the Eastern Shore is a complicated problem because of the many factors involved. One should consider the adaptation of specific crops to soil type and soil reaction; also the nutritional require-

ments, the relative acreage of each crop based on its economic importance and their place in the general plan of farming practice; the use of green manurial crops; time of planting and harvest; and prevalence of disease and insects.

This discussion is concerned chiefly with the consideration of the basic principles underlying the planning of successful rotations rather than the application of specific ones for the many areas in the State with different type of production. One of the first requirements is a system which will keep the soil in a high state of productivity by adequately maintaining its organic and nitrogen content. In areas where livestock farming is practiced in connection with vegetable production, this problem presents no great difficulty. The organic matter afforded by liberal applications of stable manure and turning under a heavy clover or grass sod once in each rotation with a green manure crop seeded in the corn, will usually prove sufficient for the maintenance of a desirable state of fertility.

In the Eastern Shore area where truck and canning crops are grown on an extensive scale and very little stable manure is available, the maintenance of organic matter is a far more difficult problem. Under present conditions, land which has been greatly depleted in fertility should not be included in the vegetable rotation until it has been greatly improved by turning under a number of green manure crops. These "marginal" acres, because of their low producing capacity, have been a source of loss to many growers of potatoes, sweet potatoes, cabbage, and other truck crops during recent years. Even on the more fertile areas, judicious use of green manurial crops is necessary for the production of profitable yields. Since most truck crops occupy the land only a portion of the growing season, it is often possible to grow both the soil improvement crop and a vegetable crop each season. The customary two year rotation of early potatoes, followed by corn the same season and sweet potatoes the next year has failed to provide sufficient organic matter for maximum yield and quality, even

when rye is seeded in the corn and after the sweet potatoes have been harvested. A three year rotation of early potatoes, followed by soybeans or sorghum in the summer, plowed under in the fall and seeded to rye, followed by sweet potatoes the second year, followed by rye in the late fall and by corn the third year with soybeans or crimson clover planted between the rows is preferable to the two year rotation.

Early crops such as spring cabbage, cucumbers, cantaloupes, and snap beans may be followed by crimson clover, or a mixture of crimson clover, rye, and vetch, if the soils are limed to provide favorable reactions for the growth of legumes. If soils are maintained in a very acid condition to prevent injury to potatoes from the scab-producing organism, many of the leguminous crops as red clover or vetch do not grow satisfactorily. The non-legumes as rye, sorghum, and sudan grass, although not as valuable as legumes, have been found quite satisfactory in maintaining the humus content in potato rotations.

Experiments conducted near Norfolk at the Virginia Truck Experiment Station from 1912 to 1922 have shown the value of green manurial crops in the vegetable rotation. In one rotation a cover crop was grown and turned under once each year during the interval between the truck crops, and on the other the ground was allowed to remain fallow while the cover crops were grown on the former. Both parts of the field received an annual application of the same amount of nitrogen, phosphorus, and potassium. The average acre yields obtained are shown in the following table:

Average Yield per Acre of Truck Crops Grown in Rotation at the Virginia Truck Experiment Station

Crop	Rotation with fallow between truck crops Pounds	Rotation with cover crop between truck crops Pounds	Increase by use of cover crop Pounds	%
Kale, 2 crops	11,880	13,360	1,480	12.5
Cabbage, 3 crops	9,480	12,080	2,600	27.4
Potatoes, 3 crops	9,240	13,860	4,620	50.0
Sweet potatoes, 3 crops	15,840	14,220	—1,620	—10.3

Green manurial crops not only increased the production of kale, cabbage, and potatoes, but also improved the quality of the first two. The cabbage in the rotation without green manurial crops made too slow growth to produce a tender high-quality product and in dry seasons many of the heads were too small to meet market requirements. The kale crop on the more fertile areas remained in a greener condition during the winter months than on the plots where no organic matter was added. The large amounts of nitrogen furnished by the leguminous cover crops was excessive for the needs of the sweet potatoes and resulted in a heavy vine growth and reduced yield.

In another rotation experiment at the Virginia Truck Experiment Station from 1925 to 1927, cabbage gave an overage increase of 26%, kale 33.8%, and potatoes 54.7% when grown in rotation with a green manurial crop each year as compared with those grown in a rotation of continuous cropping.

A second factor to be considered in planning a rotation is the acid tolerance of the various crops. Vegetables having similiar lime requirements should be grown in the same rotation. A slightly acid soil is best suited to the producton of most vegetables, but potatoes are usually grown on strongly acid soils to prevent injury from scab. Irish potatoes, sweet potatoes and tomatoes are similarly tolerant to acid soils. Cabbage, cucumbers, snap beans, large lima beans, and peas thrive best in soils slightly less acid than those generally used for potatoes. They can be successfully grown on fertile soils in rotation with potatoes if the reaction is kept near the upper limit of safety for potatoes (pH 5.2-pH 5.5). Henderson bush lima beans, spinach, lettuce, beets, and muskmelons are less tolerant and should not be grown in rotation with potatoes.

Conditions associated with too acid or too alkaline soils may seriously affect the quality of the crop. Scab on Irish potatoes and scurf on sweet potatoes resulting from the growth of organisms in too heavily limed soils may greatly depreciate the value of the crop or even render it unsalable.

Alkaline conditions may result in an inferior crop of small, tough, snap beans unfit for market, or chlorotic spinach which would be spurned by the housewife. Beets grown on too acid soils make such slow growth as to render the crop tough and fibrous; cantaloupes fail to develop a desirable size; lettuce produces small heads or only a bunch of loose leaves; and cucumbers are likely to be irregular in shape, short, spindle-shaped, and unattractive in appearance. Yields are also affected as severely as quality.

Another consideration in vegetable crop rotation is the factor of diseases and insect depredations. While the subject cannot be discussed exhaustively here, it may be well to mention a few examples where proper rotation may reduce losses.

In soils where stem rot of sweet potatoes has become established, this crop should be included in a long time rotation so as to occupy a field not more frequently than once in four or five years. The customary two years' rotation tends to increase losses from this disease.

Peas should not follow vetch or clover in the rotation because both crops may be affected by similar root rot organisms, nor be planted adjacent to a clover or alfalfa field because of the danger of infestation from aphids. The crucifers, as cabbage, brocolli, cauliflower, kale, and collards, which may be infected with black rot or black leg should not be planted consecutive years on the same area. Rotation is also beneficial in reducing losses from various diseases of the tomato, cucumber, cantaloupe, and many other vegetable crops.

The effect of stable manure on yield and quality of most vegetable crops is well understood by the practical grower. Some stable manure is available for use on most farms. The question now arises "on what crop shall it be used and at what rate will it give greatest returns?" Results of experiments conducted with a number of vegetable crops at the Maryland Agricultural Experiment Station indicate that light applications of manure plus fertilizer are quite

as effective as medium applications of manure alone or fairly heavy applications of fertilizer alone (Md. Ag. Expt. Sta. Bul. 309). An economic study of tomato production in Maryland by the Department of Agricultural economics (Md. Ag. Expt. Sta. Bul. 304) discloses some very interesting facts regarding the effect of manure on the yield of tomatoes. On the farms surveyed in five Eastern Shore counties, the following relation was found between the use of manure and the yield of tomatoes and net income for an acreage of 1925, 1926, and 1937:

County	Av. tons manure per acre	Av. yield tons per acre	Net income per acre
Talbot	9.05	6.14	29.90
Queen Anne's	7.82	4.69	19.97
Caroline	7.23	4.42	11.89
Dorchester	7.29	4.18	10.51
Worcester	3.10	3.84	9.22

There is apparently a definite relation between the use of manure and crop yield and net return. It should be realized, however, that these differences are not entirely due to the use of stable manure, since other factors such as soil type and cultural methods influenced yield. In experiments conducted by the Virginia Truck Experiment Station with tomatoes on soil similar to those on the Eastern Shore of Maryland, the use of ten tons of manure per acre with commercial fertilizer increased the yield as much as five and six tons per acre over that obtained by fertilizer alone.

Results of research have furnished some valuable facts regarding the effect of the nutritional balance on the quality of vegetables. An excess of nitrogen and deficiency of potash tends to produce long and slender sweet potatoes, undesirable from the market standpoint. Irish potatoes are likewise similarly affected but not to so marked an extent as to greatly interfere with the quality of the product. The effect of too much nitrogen on vine growth and resulting unfruitfulness of the tomato is known to most commercial growers. Phosphorus, nitrogen, or potash deficiency results

not only in a lowering of yield but also in a reduction in market grade by reducing the size of the fruits. An abundance of nitrogen is needed for rapid growth of the leafy crops such as spinach, cabbage, and lettuce, but phosphorus and potash are also essential and a deficiency of either results in retarded growth and poor quality. The use of liberal applications of commercial fertilizers, balanced to meet the needs of the particular crops is considered necessary for the production of high yields and good quality of vegetable crops in Maryland. Recommendations regarding the amounts and specific analyses for the different vegetable crops in various parts of the State may be obtained from the Maryland Agricultural Experiment Station.

At the conclusion of Mr. Zimmerly's paper, Mr. Thomas H. White of the Maryland Experiment Station suggested that where truck crops are grown on the larger farms at some distance from the cities, some method of fallowing the land would be beneficial. Where land is plowed two or three times a year, there is little opportunity for the accumulation of fertility.

Cornell University, Memoirs No. 115, "Some Relations of Green Manuring to the Nitrogen of the Soil", gives the results of ten years of plowing down hairy vetch, field peas, rye, oats, and buckwheat, following a plan that would suit orchard work. The seeds were sown in July similar to orchard practice and some were plowed in the fall and some in the spring. For comparison, some plots of mixed grasses were sown at the beginning of the experiments. The mixture was timothy, Kentucky blue grass, and red top. These plots were not plowed up until the end of the ten-year period. The vetch never grew very tall, merely covering the ground to a height of five or six inches. Field peas grew taller than vetch giving much more organic matter above ground. Rye grew two feet high. Buckwheat was usually nearly ripe when turned under and produced a large quantity of organic matter.

The moisture content of the crops turned under was determined at regular intervals. Vetch and a combination of

rye and vetch showed a higher moisture content than the others but this difference was too small to warrant conclusions.

After the cover crops had been continuously planted and turned under for ten years all the plots, grass as well as green manure crops, were plowed and corn was planted for the first year and oats the second.

At the same time the soil in the plots was analyzed for nitrate nitrogen and the results were as follows:

The grass plots had gained 412 pounds per acre. All the other plots had lost nitrogen.

The yields of the corn and oats were in inverse ratio to the loss of nitrogen and while not exactly consistent, generally the greater the loss of nitrogen the poorer the yield.

Grass gained 415 pounds nitrogen and yielded in grain 289 pounds; vetch lost 42 pounds nitrogen and yielded in grain 268 pounds; rye lost 217 pounds nitrogen and yielded in grain 221 pounds; field peas lost 380 pounds nitrogen and yielded in grain 181 pounds; oats lost 382 pounds nitrogen and yielded in grain 195 pounds; buckwheat lost 412 pounds nitrogen and yielded in grain 150 pounds.

With the exception of the field peas and oats the plots losing the least nitrogen were much the best.

The conclusions of the investigators are: That the methods mitigating the loss of nitrogen suggested by these experiments are (1) laying the soil down in grass for a period of years, (2) the culture of those legumes which are most active in fixing nitrogen among which is vetch, but not field peas.

In Cornell bulletin No. 500, which is a paper on "Effect of Crops on the Yield of Succeeding Crops in the Rotations with Special Reference to Tobacco", the authors state that following the use of vetch, crimson clover, soy beans, and cow peas, the general trend in the yield of tobacco has been downward for the period of the tests.

In a three-year rotation of tobacco, wheat, and red clover, both the yield and quality of the tobacco have been more

stable and have averaged considerably higher than those of the control plot. It is possible, however, that these results are due largely to the fact that the land is substantially in a resting condition for the greater portion of the rotation period rather than to any specifically favorable influence of the red clover. In any event, it is a striking fact that none of the cropping systems tested have given results with tobacco equal to those obtained on rested land, that is, land occupied for a period of years by adventitious vegetation.

The highest yielding plots were those which had legumes in the rotation. The two plots that produced the largest amounts of crop and nitrogen were the ones having alfalfa continuously and the one having the three of the five years, in alfalfa.

A five-year rotation including red clover at two separate periods yielded about two tons more dry matter during the rotation than did one including only one year of red clover.

During the period from 1926 to 1931 some experiments were conducted at Ridgely Station in Caroline county. One plot was cultivated and cropped continuously using green manures and commercial fertilizers. A second plot seeded to mixed grasses and grazed each year produced more than twice the yield of tomatoes in 1931 as did plot number one when both were planted to this crop.

In another series, a plot which had been allowed to grow up in weeds, instead of being cropped and fertilized with commercial fertilizers and green manures, produced at the end of a three-year period a crop of tomatoes greatly in excess of the cropped and fertilized plots.

COMPLETE FERTILIZERS FOR TOMATOES AND CABBAGE

By W. A. MATTHEWS, University of Maryland.

That manure generally increases the quality and yield of most crops is a well established fact. Since the supply

of manure has become very limited and because such a great number of complete fertilizers are being used it is necessary to determine the influence of different complete fertilizers on the quality and yield of vegetable crops.

Tomatoes and cabbage were grown as a part of a crop rotation experiment near College Park, Maryland, on a coarse, fairly fertile, sandy loam in 1931. The plots used in this test were one-twelfth acre in area. Complete fertilizers were applied at the rate of 1,200 pounds per acre to each plot. Plot One received 7-6-5, Plot Two 7-6-5 plus 12 tons of manure, Plot Three 2-8-10, Plot Four 4-8-5, and Plot Five no treatment. All treatments were made in duplicate.

The manure was applied broadcast and plowed under one month before the plants were set into the field. The fertilizer for the tomatoes was sown broadcast before planting. One-half of the fertilizer for cabbage was sown broadcast before planting, and the other half was applied as a side dressing soon after the plants were well established.

Both Bonny Best tomatoes and Early Jersey Wakefield cabbage were harvested as early crops.

The data in Table I show that 7-6-5 plus manure produced the highest yield of No. 1 grade and total yield of tomatoes. While 2-8-10 with the exception of the untreated plot was the least beneficial. There was no difference between the effect of 7-6-5 and 4-8-5.

It is shown in Table II that cabbage responded best to a treatment of 7-6-5 plus manure in producing size, early and total yield. The 2-8-10 fertilizer and the untreated plot produced cabbage of very inferior quality. The 7-6-5 produced cabbage superior to the 4-8-5 in regard to size, earliness, and total yield.

Even though the foregoing results are not conclusive they should aid growers to select more desirable complete fertilizers for the two crops considered.

TABLE I

The No. 1 Grade and Total Yield of Tomatoes as Influenced by Fertilization

(Pounds per Plot)

Plot	Treatment	No. 1 Grade	Total Yield
1	7-6-5	295	731
2	7-6-5+Manure	508	1,262
3	2-8-10	265	690
4	4-8-5	294	736
5	Untreated	74	251

TABLE II

The Size (in Pounds) Early and Total Yield of Cabbage as Influenced by Fertilization

Plot	Treatment	Size	Early Yield	Total Yield
1	7-6-5	1.45	484	1,023
2	7-6-5+Manure	1.97	750	1,401
3	2-8-10	1.02	147	725
4	4-8-5	1.36	315	959
5	Untreated	.69	17	355

Second Session

January 7, 1932

Meeting was called to order at 10.30 A. M. by President W. N. Eyler. After appointment of committees the following program was presented:

SWEET POTATO PLANTS

By THOMAS H. WHITE, Maryland Experiment Station

The sweet potato has been subjected to much investigation but seemingly very little has been done on the plants themselves.

Fertilizers, storage, marketing, and diseases have been the main lines of investigation, but the question as to whether a short stocky plant or a long stemmed, slender plant is best, seems not to have been considered.

My first instructions in raising sweet potato plants were given by an old Anne Arundel horticulturist who advised two or three inches of branch or river sand for a cover. This plan was followed for many years. Later, noticing that a neighbor invariably set out nice, dark green, stocky plants, I found, on inquiry, that he always covered with soil. We then used soil on our beds, sandy soil, and found that the plants made darker green leaves which stood up better under unfavorable conditions of weather when set in the field.

In examining the crops of sweet potatoes, over a period of many years, we have noticed much irregularity in the hills. This varied somewhat with the soils, the sandy soils giving the best salable stock. But even in the sandy soils there would be much variation—some plants or hills having many roots of nice, salable size, while others would produce mainly strings. The reason for this was not apparent and nothing in the books seemed to throw any light

upon it. During the seasons of 1927 and 1928, plants were grown from different sizes of stock, large, medium, and small sized roots. A careful experiment conducted on replicated plots showed not significant differences in the yields.

After bedding the sweet potatoes in 1930 it occurred to us that the length of the roots of the plants might have an influence on the kind of stock harvested. We then set a few roots on a green house bench and covered them respectively 1, 2, and 3 inches deep. They were then set into the field when ready. Fifty plants of each lot were used. The drouth was so severe that no crop was secured, although upon digging we found larger sized stock in the hills of the short or one-inch root stems. Fifty plants of these produced 119 roots weighing 19 pounds and the long, or three inch plants, had 67 roots weighing 11 pounds. This result seemed encouraging so in 1931 we put down six sash and carefully covered a block of two each with sandy soil one inch, two inches, and three inches deep. When these were drawn the root stem portion was found to correspond to the depth of soil except where the plant emerged from the lower side of the bedded root when they would be somewhat longer, depending upon the diameter of the bedded roots. These plants were set upon some plots of level sandy soil, which are planted in four kinds of vegetables. The fertilizer, 1,000 pounds of 7-6-5, was broadcasted and harrowed in and the rows were laid off on the level ground with a marker three feet apart. The plants were set eighteen inches apart. There were eight plots and two rows of the plants with the one, two, and three inch stem roots set on each plot. Thus, there were eight replications, two rows each of each type of roots. The rows were a fraction over 145 feet long and being three feet apart comprised enough land to make 1/100 acre or the two rows, 1/50 acre.

Samples were lifted from the one-inch plants and the three-inch plants after frost nipped the vines. The ten hills, from the one-inch roots were uniform and with a good

set of medium to large salable roots. The hills from three-inch roots were not well set with salable roots, and mainly showed one large over-sized root near the surface but the roots at the base had not developed and were stringy, not even suitable for bedding purposes.

The yields from the ten hills of one inch stem roots were 40 salable sized roots which weighed 23 pounds and 14 roots weighing one pound and one-eighth.

The ten hills from the three inch stem roots yielded 25 roots of salable size weighing 12½ pounds and 10 roots weighing one pound.

The rows on the plots were all dug October 22; each row was weighed separately.

There was some variation in the rows, but the short, one-inch root stem gave the highest yield and the medium or two-inch next and the long or three-inch roots were poorest.

The total yields of the 16 rows were:

One inch roots—primes	1212	lbs.	Roots	190	lbs.
Two " " —primes	976	"	"	188	"
Three " " —primes	849	"	"	177	"
Or per acre —	7560	"	"	1190	"
" " —	6100	"	"	1170	"
" " —	5300	"	"	1110	"

The difference in yield of the primes in favor of the one inch root stems over the three inch stems was 2,260 pounds per acre. Some further studies will be made, if possible, to discover other reasons for the manner in which the roots set, but these significant results should be considered by sweet potato growers everywhere.

Some growers will be interested in knowing the quantities of sweet potatoes in the large, medium, and small sizes required to set two sash of 3x6 size.

In an experiment conducted during 1930 we found that it required 126 pounds of the large, 101 pounds of the medium, and 88 pounds of the small sized roots to set 36 square feet of space. From these were drawn 4,355 large, 5,673 medium, and 5,520 small plants. Calculated per

pound of roots there were 34.6 plants per pound for large, 56.1 pounds for medium, and 62.7 for small roots.

A crop of potatoes, grown from the different sizes of roots, where four replications for each size were used, did not give yields significantly different; there being a total of 2,099, 1,937 and 2,004 pounds for the large, medium, and small roots.

References—Relating to Depth of Sand on Roots

Bul. March	1900, Iowa, Covered with Three Inches of Soil.
Bul. Feb.	1919, U. S. D. A. Sand or Soil One Inch at First, Later two more inches added.
Bul. Sept.	1919, New Jersey, Loam Sand 3 inches or 2 inches.
Bul. Dec.	1915, Arkansas, Sand or Light Soil 2 to 3 inches.
Bul. Mar.	1914, Georgia Sandy Soil 3 Inches.
Bul. Apr.	1916, Va. Truck, Clean Sand 2 Inches.
Bul. July	1922, Va. Truck, Clean Sand 1 to 1½ Inches.
Bul. Apr.	1931, Florida One and One-Half Inches. As Plants come through add more. Should be six inches deep over potatoes at pulling time.
Bul. Aug.	1930, Mississippi, Two Inches Clean Sand.
Circ. May	1925, Cal. Rosa, Clean Sand 3 Inches Deep.
Circ. Feb.	1921, Mo. Rosa, Soil or Sand 1 Inch then 2 more.
Bul. Dec.	1921, Miss. Sand 1 Inch, later 2 more Inches. N. J. Loam Sand, 2 to 3 Inches.

Elzey's directions for bedding are:

> Cover about one inch deep with pure sand at first and top-dress as the plants make their appearance to the desired depth (about one inch more).

PROGRESS IN VEGETABLE PRODUCTION

By W. R. BEATTIE, United States Department of Agriculture

As we look back over the past 30 years in vegetable growing, we see many changes in both our methods of production and marketing. In those early days market gardening centered around the large cities, and it was customary for a grower to produce practically all kinds of vegetables. The age of specialization had not begun, and each gardener attempted to provide for all of the requirements of his cus-

tomers. Every effort was made to have crops mature early in order to lengthen the marketing season. Such vegetables as fresh lettuce, cucumbers, and tomatoes were practically unknown during the winter months.

Then came the development of the vegetable forcing industry, and the construction of large areas of glass under which to grow hothouse products such as lettuce, radishes, beets, cucumbers, and tomatoes. For a number of years the products of forcing houses found a ready market during the winter, then came the great development of transportation under refrigeration of fresh vegetables. This made possible the specialized production of green vegetables in favorable locations such as Florida, southern Texas, and southern California.

The big development in the car-lot movement of fresh vegetables occurred during the years following the World War, or mainly during the past 10 years.

I will not burden you with a mass of figures, but taking the nine principal car-lot vegetables, we find that the shipments increased from 269,867 cars in 1924 to 427,003 cars in 1930. The car-lot shipments of lettuce in 1920 totaled 12,142 cars, but in 1930 had reached the stupendous figure of 55,700 cars.

Among the more recent changes, fresh snap beans and young or baby carrots are outstanding examples. In 1920, the total car-lot shipments of snap beans was 1,533 cars, and in 1930 it had risen to 9,445 cars. Florida shipped only 607 cars of snap beans in 1920, but sent 4,119 cars to the northern markets in 1930. The records for 1920 show a car-lot movement of young carrots of 1,602 cars, while the records for 1929 give 12,149 cars, or an increase of over 750 per cent.

I might give you many more illustrations of production and transportation changes, but I think the above will suffice to illustrate my point, in other words, the whole system of production and distribution of fresh vegetables has radically changed within the past 10 or 12 years. This has been largely brought about by the improvement in transportation and refrigeration in transit.

Just recently, the motor truck has become an important economic factor in the production, transportation and distribution of all perishable products. That the motor truck will become an increasingly important factor in this regard is apparent to everyone. Today, we have motor trucks loading perishable products from the fields in Florida and south Texas, and delivering them direct to the retail stores in cities a thousand or more miles distant from the source of production. There are no extra handling or loading charges, no refrigeration charges, and the delivery charges are extremely low considering the service rendered. In other words, the motor truck is bringing our southern production centers into easy marketing distance of our large consuming centers.

Thus far, the motor truck has not played an important part in the transcontinental movement of perishable vegetables, but its field of activity has been confined mainly to the northern and southern movement. The motor truck has, however, had a very important influence upon our local production in that it has extended the scope of local production to include a much wider range of territory around our large cities. Where the truck farmer of 25 years ago found 14 to 20 miles the limiting distance for team haul, he can now travel 75 to 150 miles with a motor truck carring five times the quantity of produce that he formerly hauled with his team.

We have several other factors which are at present limiting or changing our local production methods, for example, manufacturing requirements have changed. The introduc- of tomato juice upon the market is a good example, as its manufacture requires a special type of tomato. Chain stores and group buying have also changed production methods and requirements.

All of this leads us to ask the question, what is the answer? We find that in the well organized groups of producers around the large cities the problem has been met. As proof of this statement, the individual members of these groups are in fair to good financial condition. The vege-

table growers and market gardeners around the northern cities have fared better during these months of depression than have the general farmers.

The local market gardener has been able to find gaps in the market which are not being filled by specialized production. Many of these growers have—through the use of disease-resistant varieties, better seed, and better methods of culture—increased their acre yields. They have cut down their acreage and have cut their unit costs. They are using more labor-saving equipment, and are handling their entire business more economically than they did years ago when competition from the outside was less keen. Many of these local growers have become specialists and have devoted their attention mainly to one or two, or perhaps three or four special crops for which they have found a discriminating market.

I believe that on the whole, the local market gardeners and the truck farmers of the northeastern section are in a safer and better position today than are their competitors of the great producing areas of the South and the far West.

SOME FACTORS INFLUENCING PROFITS ON MARYLAND TRUCK FARMS

By S. H. DEVAULT, University of Maryland.

The Department of Agricultural Economics of the University of Maryland is making a study of the organization and business analysis of farms in the Piedmont Plateau and Eastern Shore regions of Maryland. Detailed data covering such information as the receipts and sales of crops and livestock products, farm expenses, use of farm equipment, efficiency of labor, farm income, labor income, interest on investment have been obtained and analyzed for the years 1929 and 1930. Similar data for the third year are now being obtained.

The purpose of the study may be stated as follows: (1) To secure data on the relative profitableness of types of farming in different parts of the State; (2) to determine factors affecting profits: (3) to study variations on indi-

vidual farms from year to year; (4) to determine to what extent farmers in the different areas should change their crop and livestock enterprise combinations: (5) and to obtain accurate data on which to base suggestions and recommendations for the more profitable organization and operation of Maryland farms.

The study is not an enterprise cost of production study but a study of the farm as a whole. Farmers need to give more attention to the organization of their farms and to the selection of different enterprises. This is one of the greatest problems confronting farmers today. Farmers may have the wrong combination of crop and livestock enterprises on their farms. They often do not know what enterprises are paying best.

The ultimate aim of all farm production is to secure the greatest profit. Profitableness resolves itself into two things—price and cost. Price is centered around producing what the market wants, when it wants it and the quantity and quality the market demands. Cost resolves itself into having the lowest cost per unit of product. Profit equals the selling price minus the cost of production and marketing multiplied by the number of units of production.

Since I am talking before the Vegetable Growers' Association, I shall discuss that part of our study which relates to truck farms, and, in addition, present and interpret the data relating to potato farms. For this study a farm was classed as a truck farm if 40 per cent or more of the income was derived from truck crops, and a potato farm if 40 per cent or more of the income was derived from potatoes.

In this address it is impossible to present and interpret the vast amount of data collected on the income, factors influencing profits and efficiency of truck and potato farms on the Eastern Shore of Maryland. I have prepared a few tables, and from this information it is possible to make certain deductions and to draw certain conclusions as to the factors influencing profits on truck farms. The figures have been combined for the two years, 1929 and 1930.

Truck Farms

From the data presented in the tables on truck farms it is apparent that the factors which were important in some

Table 1—Summary of Truck Farms, 1929 and 1930

Items	High Farms 12	Low Farms 12	All Farms 56
Measure of return:			
Receipts	$6,818	$2,362	$4,192
Expenses	3,518	2,532	2,843
Farm income	3,300	—120	1,349
Labor income	2,596	—682	747
Return on investment, %	19.4	—6	6.5
Size:			
Acres per farm	162.7	137.6	131.3
Crop acres	87	54	68
Acres in truck crops	27	15.9	21.7
Investment	12,715	11,065	10,051
Source of income:			
All crops	$5,266	$2,738	$2,141
Livestock	1,474	542	906
Tomatoes	1,847	574	1,062
Strawberries	770	309	682
Peas and sweet corn	112	66	54
Cantaloupes	749	203	375
Potatoes	457	170	310
Crop Yields per acre:			
Corn, bu.	41	27.5	31.5
Wheat, bu.	22	19	20
Hay, tons	1.24	1.5	1.23
Tomatoes, tons	7.1	5.5	5.87
Strawberries, crates	71.2	53.3	57.8
Potatoes, bushel	194.3	126	172.1
Crop index	122.8	85.6	100
Labor efficiency:			
Hired labor	$1,222	$ 790	$ 957
Total labor cost	1,986	1,008	1,668
Hired labor per crop acre	14.32	13.95	14.28
Total labor per crop acre	23.29	27.86	24.88
Machinery per crop acre	10.71	10	10.26
Labor per $100 receipts	29.35	63.44	40.45
Expenses:			
Labor	$1,411	$ 933	$1,088
Feed	331	359	294
Feed per $100 livestock receipts	26.39	52	32.96
Fertilizer	374	300	343
Fertilizer per $100 receipts	7.38	16.94	11.10

farms securing greater incomes than others can be grouped under four headings.

1. Greater size of business.

   a. More acres per farm. The most profitable farms averaged 163 acres in size as compared with 138 acres for the least profitable group of farms.

   b. More crop acres. The profitable farms had 87 acres in crops, while the unprofitable group of farms averaged only 54 acres in crops. Likewise, the profitable farms had nearly twice as many acres in truck crops.

   c. Greater volume of sales. The receipts from sale of crops, livestock and livestock products averaged $6,818 per farm for the best farms and only $2,362 for the least efficient farms, while the expenses were just about one-half of the receipts on the profitable farms and exceeded the receipts on the less profitable farms. The most profitable farms made a handsome labor income and a return of 19.4 per cent on investment, while the least efficient farms made a minus labor income and a minus return on invested capital.

   d. Greater number of productive livestock. The profitable farms had more chickens and more dairy cows and the receipts from livestock were nearly three times those of the less profitable farms.

2. More efficient production of crops and livestock.

   a. Greater yields per acres of crops. The yields on the best farms averaged over one-third more than for the low income group of farms. The most efficient farms obtained 13.5 bushels more corn per acre, 3 bushels more wheat, 1.6 more tons of tomatoes, 17.9 more crates of strawberries, and 68.3 more bushels of potatoes per acre.

Table 2—Crop and Animal Production in Relation to Profitableness of Truck Farms, 1929 and 1930

Crop Production Index	Most Profitable Farms	Least Profitable Farms	All Truck Farms
Crop acres	87	54	68
Acres in truck crops	27	15.9	21.7
Per cent of receipts from truck crops	67.1	62.8	67.7
Yield per acre of tomatoes	7.1	5.5	5.87
Crop index	122.8	85.6	100
Number of cows	6.11	3.86	3.99
Milk sales per cow	108.94	97.84	67.47
Number of hens	176.1	169.5	162.24
Egg sales per hen	2.23	1.79	1.05
Livestock receipts per $100 invested	89.65	69.79	49.99

Table 3—Relation of Acres in Truck Crops to Labor Income, 1929 and 1930

Acres in Truck Crops	Number of Farms	Farms with incomes below the average	Labor Income
0-10	11	9	$ 152
11-20	26	18	511
21-30	10	4	1,249
31-over	9	2	1,674
All Truck Farms	56	33	747

Table 4—Relation of Gross Receipts to Labor Income, 1929 and 1930

Gross Receipts	Number of Farms	Farms with incomes below the average	Labor Income
$ 0-$2,000	16	15	$—173
2,001- 4,000	14	11	230
4,001- 6,000	12	5	1,026
6,001- 8,000	9	2	1,837
8,001-over	5	1	2,262
All truck farms	56	34	747

b. Greater returns from livestock. Milk sales per cow and egg sales per hen averaged more on the best farms. The most efficient farms received in livestock products $89.65 per $100 invested in livestock as compared with $69.79 for the inefficient farms.

3. More efficient management.

a. Less labor cost per $100 of receipts. While the the total cost of hired labor and of family labor averaged more on the best farms, the labor cost per acre was somewhat less and the labor cost per $100 of receipts was considerably less than on the unprofitable farms.

b. Larger sales per acre of crops. The sales of crops per acre averaged more on the best farms.

c. Larger sales per unit of livestock. The more profitable farms got greater returns from livestock.

d. Less expense per unit of product. Feed cost on the profitable farms averaged only $26.39 per $100 of livestock receipts as compared with $52 for the unprofitable farms. Fertilizer averaged slightly more in cost per farm on the profitable farms, but less than half the cost per $100 of receipts as compared with the unprofitable farms. Also labor cost per $100 of receipts was considerably less on the profitable farms.

4. Better balance of enterprises.

While truck farms had more acres in truck crops and received a greater percent of the total income from truck crops they likewise received more income from livestock and the products thereof. The best farms apparently grew tomatoes, strawberries, cantaloupes, potatoes, peas and sweet corn. The receipts from all of these crops were greater on the more efficient farms.

Potato Farms

The year 1929 was a very successful one for the potato growers of the Eastern Shore and most of them made a fairly large income. Some potato farmers, however, were unsuccessful even in 1929. The year 1930 was not only a poor year for the potato growers but for farmers in general. The income from potato farms in 1929 averaged $2,817 per farm and in 1930, $341. The labor income in 1929 averaged $2,214, and in 1930, a minus $154. The income from truck farms in 1929 was $1,708 per farm and in 1930, $989. The labor income from truck farms was $1,105 in 1929 and $389 in 1930. This represents a considerable shrinkage in both the farm and labor income of 1930 over 1929, but the potato farms faired worse than the truck farms. The potato farms made the highest farm income on the Eastern Shore in 1929 and the lowest income in 1930. On the other hand, the truck farms made the smallest income in 1929 and the largest income in 1930.

Table 5—Summary of 75 Potato Farms on the Eastern Shore, 1929 and 1930

Item	High Farms 17	Low Farms 17	All Farms 75
Measures of return:			
Receipts	$ 8,249.00	$2,507.00	$4,513.00
Expenses	4,068.00	2,675.00	2,934.00
Farm income	4,181.00	—168.00	1,579.00
Labor income	3,540.00	—682.00	1,030.00
Return on capital, %	27.9	—7.5	8.9
Size:			
Crop acres	$ 75.0	$ 63.0	64.8
Investment	12,819.00	10,284.00	$10,979.00
Acres in early potatoes	23.7	12.8	15.6
Acres of tomatoes	5.6	3.4	3.8
Hens	167.3	162.5	179.7
Source of income:			
Receipts from:			
Crops	$6,829	$ 2,103	$3,666
Livestock	1,239	374	752
Other sources	182	24	92
Potatoes	5,094	1,481	2,646
Tomatoes	487	210	283
Poultry	765	264	474
Dairy	391	69	200

Crops yields per acre:			
Crop value per crop acre	$ 91.05	$ 56.53	$ 33.38
Early potatoes, bbl	61.2	51.0	56.7
Tomatoes, tons	5.2	3.9	4.4
Corn, bushels	32.6	24.1	28.4
Hay, tons	1.6	1.4	1.5
Crop index	111.0	95.1	100.0
Livestock returns:			
Egg sales per hen	$ 2.71	$ 1.20	$ 1.80
Livestock returns per $100 Investment in livestock	93.00	66.00	36.00
Labor efficiency:			
Hired labor	$1,069.00	$ 724.00	$ 659.00
Total labor cost	1,669.00	1,324.00	1,259.00
Labor per $100 receipts	20.00	53.00	27.90
Labor per crop acre	22.00	21.00	19.00
Average number of men	2.8	2.2	2.1
Acres worked per man	26.8	28.6	30.9
Machinery per crop acre	10.43	10.57	10.70
Fertilizer efficiency:			
Fertilizer per crop acre	$ 13.44	$ 10.05	$11.16
Selling price of:			
Early potatoes per bbl	$ 3.16	2.89	$ 2.98

Table 6—Labor Income of Potato Farms, 1929 and 1930

Class	1929	1930	Average
Most Profitable	$6,198	$ 882	$3,540
Average	2,214	—154	1,030
Least Profitable	—72	—1,292	—682

Table 7—Relation of Early Potato Acreage to Labor Income 1929 and 1930

Number of Acres in Potatoes	1929	1930	Average
0- 5	$ 35	$—110	$ 16
6-10	1,116	+60	718
11-15	2,406	—224	1,174
16-20	2,275	—596	634
21 and over	6,376	+6	3,646
Average 15.6 acres	$2,214	$—154	$1,030

Since our study includes one bad year and one poor year, combined figures on potato farms for the two years would give a better indication of the relative position of the potato industry. Tables 5, 6, and 7 give the combined results on potato farms for the years 1929 and 1930.

The chief factors influencing profits on potato farms are about the same as for truck crops, that is, (1) greater size of business, (2) greater production of crops and livestock, (3) more efficient utilization of labor and machinery, (4) and more efficient management. I shall briefly discuss the significance of these factors.

The most efficient farms had more acres in crops, nearly twice as many acres in potatoes, more productive livestock, a slightly greater investment, and gross receipts over three times as much as for the least profitable farms. Farms of less than 11 acres in potatoes were far below the average in labor income, whereas those with more than 20 acres in potatoes made a large labor income.

The better farms with a greater acreage in crops and particularly in early potatoes, obtained considerably higher yields per acre, averaging 10 barrels more of potatoes per acre. Likewise the yields of all crops were considerably higher on the best farms, averaging 11 per cent above the average of all farms and 16 per cent above the least profitable group of farms.

The best farms derived more income from livestock. Poultry is the important source of livestock receipts and is more efficient on the better farms returning $2.71 per hen in egg sales as compared with $1.20 per hen on the least profitable farms. Poultry is an enterprise that blends well with most types of farming and seems ideally suited to help potato farmers weather years of poor potato prices.

Labor is the largest item of expense on most farms under present conditions and it is necessary to economize in its use. The more profitable farms being of greater size are more economical of labor. The better farms spent only $20 for labor for every $100 of receipts as compared with $53 spent on the least profitable farms.

That the better farms were more efficiently managed is evidenced by the fact that they obtained greater yields with lower costs per unit of production and obtained greater returns per acre and per unit of expense. The better farms also supplemented the revenue from potatoes with revenue from poultry products and tomatoes to a greater extent than was true with the unprofitable farms. It should also be observed that the price received for potatoes on the most profitable group of farms was higher than the average or the least profitable farms. Whether the higher price can be attributed to better quality of potatoes produced on the good farms or to better selling methods I do not know. It is probably the result of both.

Undoubtedly in Worcester and Somerset counties potatoes is one of the most, if not the most, successful crop year in and year out that can be grown on that soil. The year 1929 was a good one for the potato growers, while 1930 and 1931 were disastrous ones. With one good year, one fair year, and one poor year out of every three, farmers can come through on potatoes provided they save enough money in the good years to tide them over the bad ones. Some farmers, of course, consistently make good incomes year after year, while other farmers consistently produce at a loss. It may be a question of the farmer himself, or of his land, or equipment, or of all three.

Potato growers should give some consideration to diversifying their farm business by producing in addition to potatoes some other crops that are well adapted to the region and will return a profit above cost of production. Our studies show that neither extreme specialization nor diversification pays best in Maryland. In the long run the farmer should choose one or two major enterprises that will return a profit over a series of years and combine with these as many supplementary or complementary enterprises as will add enough to the income of the farm to make it worth the effort to produce them.

At the conclusion of the program it was voted that the present officers hold over for another year.

The auditing committee examined the treasurer's accounts and found them to be in order, with a balance of $12.37 on hand.

The Certified Potato Show

The 1932 Potato Show brought together a representative exhibit of seed stock certified according to the standards of the Maryland State Certification Board.

The winners in the various classes are listed below:

Class IX—Irish Cobblers.
1st place—Clark Smith, Pocomoke, Md.
2nd place—F. J. Dukes & Bro., Girdletree, Md.
3rd place—W. A. Ward, Pocomoke, Md.
4th place—W. F. Bunting, Pocomoke, Md.

Class X—Rural Russet.
1st place—Boyd Hardesty, Oakland, Md.
2nd place—D. A. King, Accident, Md.
3rd place—J. Wilbur, Hoyes, Md.
4th place—E. F. Garletts, Selbyport, Md.
5th place—E. F. McClintock, Accident, Md.
6th place—R. Seabold, Hoyes, Md.

Class XI—Any Other Variety of Potatoes.
1st place—Handy Truitt, Snow Hill, Md., McCormick.
2nd place—R. W. Stagg, Jr., Snow Hill, Md., Jersey Redskin.
3rd place—Samuel Hearn, Laurel, Md., Jersey Redskin.

Class XII—Sweet Potatoes, any Variety.
1st place—W. P. Hotton, Salisbury, Md., Bigstem Jersey.
2nd place—H. P. Elsy, Salisbury, Md., Bigstem Jersey.
3rd place—Curtis Wolff, Rhodesdale, Md., Littlestem Jersey.
4th place—Harry Messick, Seaford, Del., Littlestem Jersey.
5th place—W. T. Pilchard, Pocomoke, Md., Bigstem Jersey.
6th place—W. T. Bunting, Pocomoke, Md., Bigstem Jersey.

REPORT

of the

Maryland Stockmen's Association

THIRD ANNUAL MEETING

January 6 and 7, 1932

BALTIMORE, MARYLAND

FIRST SESSION

The first session of the Third Annual Meeting of the Maryland Stockman's Association was called to order by the vice-president, Mr. J. W. Jones, of Montgomery county, in the absence of the president, Senator H. D. Wolfe, of Howard county.

The report of the secretary-treasurer, which follows, was presented and accepted, and the secretary-treasurer was authorized to draw a check to cover the cost of the 1931 La Plata ram sale.

REPORT OF THE SECRETARY-TREASURER FOR 1931

B. E. CARMICHAEL, College Park.

Mr. Chairman and Gentlemen:

Maryland livestock interests have experienced a pretty difficult year during 1931, and the depression has had some effect on the activities of the Maryland Stockmen's Association. Notwithstanding the difficult conditions that have been faced by Maryland livestock farmers, there is good season for believing that they are interested in still further

improving the livestock industry of the State and are willing to support an active Stockmen's Association. In January, 1931, a good three-session meeting of the Association was held in Baltimore, at the Lord Baltimore and Claremont hotels. There was an excellent program, participated in by good speakers from out of the State, as well as from Maryland. Members of the association have received the annual report of that meeting, and details of it will not be presented now.

The past year has been one of at least moderate activity for the Maryland Stockmen's Association. Our total paid membership for 1931 has amounted to 90, not so many as we should like to have, but still a very good number when all conditions are considered.

During the year the Maryland Litter Contest has been continued, with a total of 37 entries. This Contest seems to deserve a wider interest and a larger number of entries. It is believed that results which participants have achieved will have a definitely beneficial influence upon the swine industry in Maryland.

Purebred ram sales have been held at La Plata, Pocomoke, Boonsboro, Timonium, Centerville, and Oakland. These sales have been the means of securing an almost State-wide distribution of good breeding rams.

A monthly News Letter has been continued during 1931. Members are urged to send in items of interest for publication in this letter, so that it may have as great usefulness as is possible.

The financial statements is as follows:

1931 Receipts

January, 1931, Balance	$320.30	
1931, 143 banquet tickets and membership dues in addition to 27 included in Jan. 1931	143.00	
1932, Two banquet tickets and 5 memberships paid for before this report, Jan. 5, 1932	7.75	
Total receipts		$471.05

Expenditures

1931			
Jan. 8.	Lord Baltimore Hotel, headquarters and telephone	$5.80	
10.	Baltimore Coach Co., 2 coaches to yards and return	16.00	
12.	M. Lucille Hardiman, expenses reporting meeting	1.85	
13.	James W. Stoddard, Banquet at Claremont Hotel (check for $81, $1 in currency)	82.00	
Feb. 3.	K. A. Clark, Expenses showing Ram Sale reel at dinner-meeting	10.00	
May 1.	Maryland Farm Bureau Federation 1, 1931 dues	20.00	
6.	University of Maryland Press 2,000 No. 10 envelopes	9.50	
June 2.	University of Maryland Student's Supply Store, 4,000 sheets mimeograph paper	5.40	
June 5.	University of Maryland Student's Supply Store, 1 quire stencils	3.00	
	1931 Deficit, 5 ram sales	9.42	
1932.			
Jan. 4.	University of Maryland, telephone bill acct. Annual Meeting	2.65	
4.	University of Maryland press, 150 banquet tickets	1.00	
	Total expenditures		162.97
	Balance, Jan. 6, 1932		$304.43

The Association has $10.00 invested in lumber for hurdles at Pocomoke City, which it is expected to charge against future sales use.

There is a bill of $38.22 for ram sale expenses for the ram sale sceduled for La Plata at which only two rams were sold. This expense was advanced by Mr. K. A. Clark, and authorization is requested to compensate him for this expense. At a Centerville sale two years ago the association netted $245.24, and a part of this should now be used for meeting the cost of advertising the unsuccessful 1931 La Plata sale.

Upon the arrival of President Wolfe, he took the chair, and in a brief, thoughtful address reviewed briefly the agricultural situation with special reference to the livestock industry. He urged stockmen to continue in the business

and to use good livestock and good methods of breeding, feeding, and management in order to be ready to participate abundantly in better times and better prices when these come.

PRESIDENT WOLFE: Mr. K. A. Clark, of the University of Maryland Extension Service, has managed a number of ram sales during the past year, and we will now have his report of that important project.

THE 1931 PUREBRED RAM SHOWS AND SALES IN MARYLAND

By K. A. CLARK, College Park

Mr. Chairman and Gentlemen:

When the first ram sales were started, there were not enough good purebred rams within the State to fill them. It was frequently necessary to go outside the State and import rams for the sales. While this was going on, a number of far-sighted sheepmen saw the need for home-grown rams of high quality and started out to produce them. No less than 1,000 purebred breeding ewes are to be found in Maryland flocks today as a result of the activity of these breeders. In fact, they developed their business more rapidly than the outlet for the rams was developed. As a result, we found approximately 200 purebred rams in the State early in 1931, with a prospect of selling through our Centerville and La Plata sales about 50 head. Strenuous effort was made to dispose of a carload of these good rams in the South, and also in New England. These efforts failed. It was decided to start several additional sales and to sell them at home. Despite low lamb and wool prices and other adverse conditions, this solution of the situation was tackled with energy. New sales were announced at Pocomoke, Boonsboro, Timonium and Oakland. Added to the Centerville and La Plata sales, it made a total of six sales, and it brought a ram sale within easy

motoring distance of every sheepman in Maryland. They were held between June 25 and September 12. The results are recorded elsewhere in this report.

A few comments concerning the conduct and the management of these events may be of interest. A series of newspaper articles are started several weeks in advance of each show and sale. These releases are prepared by the Extension Animal Husbandman who acts as Manager for all the sales. The releases are sent to the county agents in the territory of each show and sale, who see to it that they are carried in the papers. A separate set of releases is prepared for each sale. It is true they are quite similar in some instances, but the first requirement is that they be adapted to the territory into which they are going.

These releases are built around experiences of successful sheepmen, the judge, the sales that have gone before, opportunities for sheep raising, the suitability of this section for sheep, and a host of other things around which can be woven a story of the show and sale. Effort is made to have the releases educational and newsy—appealing to farmers and sheepmen whether they be interested or not in the sale itself. The vernacular of the sheepmen is used with some disregard perhaps to some of the so-called better principles of publicity. In addition to the news releases, paid advertisements are placed in the newspapers in the territory of each sale. A uniform 3-inch double column advertisement has been adopted. This is run either one or two weeks prior to the sale. It is always run two weeks in the papers of the town where the sale is to be held. The county agents pay for these advertisements, and they in turn are reimbursed by the Manager. It has been observed that the papers are very glad to have the county agents, of all people, walk into their office and pay for some newspaper space! In addition to the general publicity and paid advertising, the county agent generally sends out a letter and, later, a card to all the sheepmen in his county. If there is any one factor responsible for the success of these shows and sales, it is the publicity, and the county agents deserve

most of the credit. Study and care have been put into the preparation of the releases and they were out on time. Also, every detail of the publicity planned was carried out.

All these shows and sales were held in the open. Some shady spot near the center of town is always selected. In selecting the towns in which to hold the sales, no attention has been paid to anything in particular, except sheep population and geography. Other things being equal, a small town seems preferable to a large town.

The rams are brought in the morning of the sale and numbered on their backs with their catalog numbers by means of quick-drying black paint. They are all placed together in a pen about 16 or 20 feet square. To make this pen, we simply use 4 hurdles made of light, clean lumber. We provide seats, benches and chairs for the people attending the sale. These seats are arranged in a semi-circle on one side of the pen where the rams are located. Then when the sale starts, a fifth hurdle is placed through the center of the pen and all the rams are placed on one side of it. The rams are brought out one at a time and held while being sold. After each ram is sold he is returned to the pen on the other side of the dividing hurdle. This prevents any mix-up and is a simple, convenient way of handling the whole thing without any confusion or mistake.

Every effort is made to have the rams in good flesh, well trimmed and nicely conditioned for these sales. When the rams are right, they will sell. Each year there is a consistent demand for the high quality rams.

Every ram brought into the ring is sold regardless of price, provided there are at least two bids upon him. By-bidding, reserve bids and other similar practices are not permitted in any way, shape or form. Consignors are sometimes permitted to withdraw their rams, but this must be done before they get into the ring.

The breeders guarantee their rams to be healthy and without known defects, but nothing further. In case any ram proves to be a non-breeder, he may be returned to the

seller, and the cash purchase will either be refunded or an equally good ram will be substituted for him.

A show of all the sale rams was started at the 1930 sales. This feature seemed to have quite an appeal to consignors and buyers alike and was included in all the 1931 sales. The show is held during the morning and before the sale begins. Some recognized judge is invited to pass on the entries. Every one takes quite a keen interest in this part of the program. The show idea should be continued, but in the future, both the show and sale will probably be held in the afternoon, instead of having the show in the forenoon and the sale in the afternoon as has been the custom in the past.

The expenses of each sale are divided by the number of rams sold to arrive at the cost per ram. In making out the returns for a sale, the sale expenses are deducted and checks representing the net proceeds are forwarded to the consignors. There are no expenses except the actual costs involved in the conduct of the sale. Some responsible person serves as clerk to each sale. Usually this is a neighboring county agent. The local county agent is seldom allowed to serve as clerk because he usually has a large number of local farmers present, and he is too busy. The rams must be paid for before they are taken away. All the money is paid to the clerk who turns it over to the secretary-treasurer of the Maryland Stockmen's Association. The Manager of the sale submits an itemized account of the expenses. Then the secretary-treasurer of the Maryland Stockmen's Association draws the checks and sends them, together with a full statement, to the different consignors.

Most of the rams are taken away by their new owners immediately after the close of the sale. It is seldom one is to be crated and shipped by express or some other way. We always arrange to do this, however, in case it is requested. A uniform charge of $2.50 per ram is made for this service. This fee includes crating and delivering to express office.

All these various arrangements and policies that have to do with the conduct and management of these shows and sales have the unanimous support of the breeders and it should not go without saying that they have backed these sales to the limit. They have never faltered even in discouraging times, and the solid establishment of our sales is a great tribute to the character of the breeders who make them. This statement is even more significant when it is observed that there is no breeders' organization, no contract signed, and no committee to select or reject entries, nothing but the understanding of sportsmanlike breeders to give these policies direction, to insure their integrity and to keep them virile.

Following is a complete summary of the purebred ram shows and sales held during 1931:

Summary

	No. Rams Sold	Av. Price Per Head	No. Different Counties Taking Rams*	No. Different Individual Purchasers	Total Cash Amount
La Plata	2	$25.00	1	2	$50.00
Pocomoke	30	12.77	4	26	383.00
Boonsboro	26	12.44	2	21	323.50
Timonium	20	17.12	5	15	343.50
Centerville	24	21.66	4	14	520.00
Oakland	20	17.90	1	19	358.00
Total	122	$16.21	17	97	$1,978.00

*Maryland Counties Only.

PRESIDENT WOLFE: Doctor H. E. Moskey of the United States Department of Agriculture will now discuss a subject of much importance to stockmen of Maryland, "Misbranded Veterinary Preparations."

MISBRANDED VETERINARY PREPARATIONS

By H. K. MOSKEY, Food and Drug Administration
U. S. Department of Agriculture

Mr. Chairman and Gentlemen:

I am pleased to have this privilege of discussing the activities of the Food and Drug Administration in the control of misbranded veterinary preparations, because I believe you gentlemen, representing various phases of the livestock industry, are particularly interested in this work.

As you undoubtedly know, the Federal food and drugs act forbids false and fraudulent therapeutic claims on the labels of drugs and medicinal preparations. For 25 years the Department has directed its regulatory attention to the drugs industry, and, so far as medicinal preparations designed for human use are concerned, the public is more or less aware of the extent of this work. But the Administration is also charged, in the enforcement of this law, with removing from the channels of trade misbranded or adulterated medical preparations designed for treating domestic animals.

The farmer, most directly concerned, is inadequately informed on just what the Administration has done along this line. An efficient farmer naturally wants his livestock to be healthy. This desire, without a proper knowledge of what constitutes a reliable treatment or cure for certain livestock diseases, has led him to spend much hard-earned money for remedies of no value whatever in the treatment of livestock diseases. So serious is this situation that the Food and Drug Administration has, during the past few years, directed as much of its attention to those drug products as its funds and personnel would permit.

The Administration is also charged with the enforcement of the Federal insecticide act, which has jurisdiction over interstate shipments of insecticides and fungicides.

It appears, however, that there is some misconception as

to the actual jurisdiction the Administration has over veterinary medicines, insecticides and fungicides. In so far as claims dealing with what the product will do are concerned, the Federal Food and Drugs Act and the Federal Insecticide Act confer jurisdiction only over labelings and circulars accompanying the shipments of the article. These acts do not confer any jurisdiction over false and extravagant claims made for products in newspapers, farm papers, radio advertising, etc., or claims made in circulars and other advertising matter distributed separately.

The Post Office Department has jurisdiction over printed matter sent through the mails; and the Federal Trade Commission has authority over unfair trade practices, which include some advertising. Complaints regarding such practices should be submitted direct to the Government agency having jurisdiction. The Department of Agriculture is, however, co-operating with all government agencies to eliminate false and fraudulent claims made for drugs insecticides and fungicides.

The question is frequently asked, "Who determines whether or not the labeling constitutes misbranding?" The Federal courts, alone, have the authority to rule upon the legality of products coming within the scope of these acts. The Department is charged merely with the administrative responsibility of referring cases to the courts for trial when, after a thorough investigation of all the facts, it is concluded that a violation of the law exists. In the Department's investigation of any particular product the first step is to submit the product to chemical analysis. The next step is to determine whether or not the claims made on the labeling express promises in excess of the known pharmacological action of the ingredients, individually or in combination. All information available bearing on the subject is obtained. The Department gets from leading veterinarians the actual opinions held by that profession. It may also be necessary for the Administration to have actual tests conducted by competent investigators to deter-

mine whether or not the claims made for the particular product are justified.

It must be remembered, however, that these laws were not created to prevent manufacturers from selling legitimate drug, insecticide and fungicide products to the public. Their enforcement prevents dishonest competition in the sale of medicines. The purpose of these laws is to prevent the public from being misled or deceived by the products, or by claims made on the labeling. In so far as the language used in the labeling is concerned, the Supreme Court has said, referring to the food and drugs act, that:

"The statute is plain and direct. Its comprehensive terms condemn every statement, design, and device which may mislead or deceive. Deception may result from the use of standards not technically false or which may be literally true. The aim of the statute is to prevent that resulting from indirection and ambiguity as well as from statements which are false. It is not difficult to choose statements, designs and devices which will not deceive. Those which are ambiguous and liable to mislead should be read favorably to the accomplishment of the purpose of the act."

Under the terms of the laws the Department has no authority to make public the results of its investigation of any specific product, except in the manner prescribed by the laws, which is in the form of a notice of judgment issued after the case is terminated by the court. The Food and Drugs Administration does, however, give out information of a general character in the form of press notices, radio talks, and trade notices. Trade notices are issued as far as practicable to all manufacturers and shippers who are distributing their products within the jurisdiction of the laws as to the legal requirements imposed upon them. The purpose of disseminating such information is to effect a maximum degree of voluntary compliance by that great majority of drug manufacturers who are honestly endeavoring to market legal products.

Press notices are issued to the editors of farm papers, poultry journals, and to the press in general, and occasional radio talks are given to enlighten the public of the activities of the Administration in the enforcement of its laws. Copies of these notices may be secured from the Department upon request.

Drug remedies for hog cholera have been very prevalent in the past. These so-called "cures" are now rapidly disappearing from the market through the persistent activities of the officials of the Department of Agriculture. Products of this character not only lacked curative properties, but were actually harmful because they interfered with proper known preventive measures. Even though the Department has succeeded in ridding the market of hundreds of preparations of this nature, the number of letters coming in to the Department daily from individuals claiming to have discovered a sure cure and preventive of hog cholera is surprising. It is therefore necessary for the Administration to have its inspectors constantly watching for interstate movement of these products.

Since there is no drug or mixture of drugs known to veterinary science which can be considered effective in the prevention and treatment of Bang's disease, also known as "contagious abortion", a vigorous four-year campaign has driven these falsely and fraudulently labeled preparations from the market, or has forced manufacturers to revise their labels so as to eliminate claims relating to this disease. During the campaign hundreds of samples were collected and analyzed. Most of them consisted essentially of medicated colored water, colored table salt, with carbolic acid, brown sugar, and bran, creosote, or drugs acting as irritants or vascular stimulants. Some of these were very simple and inexpensive drugs disguised in different ways. Others were mineral mixtures with or without added drugs of any kind. One so-called "rememy" for contagious abortion which was proved to the satisfaction of the court to be fraudulently labeled was tested on cattle by the U. S. Bureau of Animal Industry. Although the Bureau proved

that this preparation was ineffective in the prevention or treatment of the disease, the manufacturer was able to present to the Department many letters from dairymen in all sections of the country, testifying that the preparation had been effective in curing the disease. This is explained by the fact that contagious abortion of cattle tends to die out in herds to which no susceptible animals are added. Many livestock owners had been led to believe that the various medicinal agents were effective when, in reality, the improved conditions in their herds were the result of an acquired immunity or tolerance to the disease. None of the preparations studied by the Department would have the slightest value in the prevention or treatment of contagious abortion or any of the conditions which may follow it, such as sterility and other breeding troubles. So effective has been the campaign against these products that the Administration's latest investigation has shown that interstate commerce has probably been cleared of contagious abortion nostrums. There may be some preparations of this character which are made locally and not entered in interstate trade, and therefore do not come under the jurisdiction of the Federal food and drugs act. In many cases the Administration has required the removal from the label of all untruthful and fraudulent claims only to discover some unwarranted statements in advertising, over which the law has no control. The Department believes it is a good practice not to place confidence in circulars or other advertising matter which exceed those claims made on the printed matter which actually accompanies the product in interstate commerce.

It is well known to the veterinary profession that milk production of dairy cows cannot be increased above normal by the feeding of any known drug or any combination of drugs. Decrease in milk production may be the result of many factors, such as chronic and acute infectious diseases, external and internal parasitic diseases, digestive disturbances, and lack of a properly balance ration. If there is a mineral deficiency in the ordinary diet, certain

mineral elements, when added to the feed, may make up for the mineral deficiency. Products of this character cannot, however, be truthfully represented as increasing milk production above normal. Certain bitter stomachics may temporarily act as a stimulant to the appetite. This does not mean that the continued use of appetizers will increase milk production. In the activities of the Administration against medicinal products falsely and fraudulently represented to increase milk production, a judgment was secured against a product represented on the label as "a milk producer." The statements appearing on the label and in the literature sent with the preparation claimed that the product, when fed to cows, "increases the milk," and that "nothing has been so consistently popular (as the milk producer) in making milk because there is nothing else so consistently good. Takes the place of green pastures in making milk and making it pay." The preparation was lauded as "The Secret of Success in the Science of Milk Making." The manufacturers advised the consumer to "feed it to the average producing cow for the *extra* milk it will produce." They promised, "Give a tablespoonful twice a day to each cow and you will get returns in added milk production." The court upheld the Department's allegation that these claims were false and misleading in that the article contained no ingredient or combination of ingredients capable of producing the results promised. Analysis of the product by Government chemists showed it to consist of sodium chloride, magnesium sulphate, sodium thiosulphate, potassium nitrate, and small amounts of nux vomica and fenugreek.

The so-called "conditioners" and many other products have often been found to be labeled as containing "health-giving properties." The use of the word "health" in the labeling of drug and food products has been found to be badly abused by manufacturers. The Administration, in the enforcement of the Federal food and drugs act, is of the opinion that health cannot be sold in bottle, box or bag, as food or drug preparations for animals. In December,

1930, the courts rendered a judgment in favor of the Department in a case against a preparation called "Liquid Hog Health", in which the Department alleged that the article was misbranded. The manufacturer of this preparation claimed that the oats treated with it would cure sick hogs, and stimulate the growth of backward pigs and shoats. The Food and Drug Administration proved to the satisfaction of the court that the preparation contained no ingredients capable of producing the effects claimed.

In a survey of preparations for hogs we find that hundreds of manufacturers are distributing products labeled for the disease known as "necro" or necrotic enteritis. Given proper sanitary precautions and the use of a soothing diet, the disease, in the early stages, is more or less self-limiting in nature, and since spontaneous recoveries are not unusual, users of ineffective preparations often accredit the cure to the worthless medicine. Preparations recommended for the prevention and cure of this disease, consequently, have had wide usage. The claims are based on the sodium hydroxide content which ranges from two to five per cent in the product as sold. The labeling directs that one quart of the remedy should be diluted with fifteen gallons of water and added to three bushels of oats which are fed after ten hours soaking. The amount of sodium hydroxide which an average size pig would consume daily from eating this mixture would probably not exceed one to two grams, which would presumably be changed to sodium carbonate. It is reasonable to assume, from our knowledge of physiology, that this amount of sodium hydroxide or sodium carbonate upon entering the stomach would react with the hydrochloric acid and be changed to sodium chloride before reaching the intestinal tract where the actual lesions of the disease are located. There is no evidence, as far as the Administration can determine, that any properly controlled tests have shown that there is any drug or mixture of drugs which can be depended upon to prevent or cure necrotic enteritis of hogs. It is apparent that these products cannot be truthfully represented to the public for

this purpose. Preliminary report of a test conducted for the Administration of two representative samples of products of this character showed no therepeutic value in the treated pigs as compared with the untreated or controlled pigs.

In view of the importance to the livestock industry of internal parasites from an economic standpoint, the Administration in the enforcement of the law has given considerable attention to this class of products. Farmers who have read the papers in recent months have probably noted a great many advertisements of mineral mixtures, tonics, and conditioners in which the manufacturers claim that such preparations control worm infestation in farm livestock, including poultry. Such claims made for products of this character constitute misbranding under the law. Veterinary investigators have found that preparations of this nature have not proved effective in the control of worm infestation. Moreover, there is no drug mixture of drugs known to science at this time which would be effective as an expeller of all types of worms which may infest animals, including poultry. The Department has warned manufacturers of worm remedies, or worm expellers, to confine their claims in the labeling to the particular type of worm for which their product has been proved to be effective, based on adequate critical tests. The unqualified use of terms such as "worm expellers", or "worm remedies" in the labeling of medicinal preparations is a violation of the food and drugs act. Actual tests of some of the products investigated containing mixtures of ingredients represented in various textbooks as having anthelmintic action showed the products to be ineffective for expelling any type of worm. Critical tests have shown that some drugs when used alone are efficacious for expelling certain types of worms, but if mixed with other anthelmintics may be rendered non-efficacious.

Within the past few years there has been a tendency on the part of some manufacturers of mineral mixtures to make many false and misleading claims for such products,

particularly in collateral advertising. The claims vary and give the impression that the feeding of mineral mixtures to livestock, including poultry, will cure or prevent serious infectious diseases, prevent worm infestation, expel worms, purify the blood, prevent blood and digestive disturbances, clean the digestive and intestinal tract, and increase milk and meat production. Mineral mixtures are misbranded if they are represented as preventives or treatments for infectious diseases of farm stock, or as preventives of worm infestation, or as efficient worm expellers. The Administration is instituting vigorous action to prevent interstate trade in such mislabeled products. Minerals may be added to the feed of animals to make up for possible mineral deficiencies in the ordinary ration. The addition of minerals to the feed, however, cannot truthfully be said to be effective in creating a resistance to contagious or infectious diseases, nor is there sound reason to believe that the feeding of such minerals is effective in the treatment of these diseases. The restoration of a proper mineral balance in the ration, through the addition of certain mineral elements, may result in normal egg, milk, or meat production when decreased yields are due to a lack of minerals in the feed. Decreased yields, however, may be due to many other factors. Claims that the use of minerals will stimulate the quantities of milk, eggs, and meat produced create an erroneous impression in the mind of the buyer.

Inasmuch as modern veterinary science does not recognize any drug or mixture of drugs as being effective in the treatment of Bang's disease (also known as contagious or infectious abortion of cattle) dysentery or scours of calves, sterility or barrenness, hog cholera, influenza of swine or hog flu, fowl cholera, pullorum disease or diarrhea of chicks, coccidiosis, contagious or infectious roup, chicken-pox or diphtheria, gapes of chicks, black-head of turkeys, influenza, distemper or strangles, and heaves of horses, active steps have been taken by the Administration to remove products labeled as treatments for these diseases from interstate commerce.

Many other preparations bearing false and fraudulent claims receive constant attention by the Administration. These include such products as stock powders, conditioners, regulators, tonics, cod liver oil and other vitamin preparations, liniments, salves, caustics and blisters.

A survey of preparations labeled for increasing egg production, fertility and hatchability of eggs revealed the fact that many such products are on the market. Since no known drug or combination of drugs, when fed to poultry, can be considered to increase egg production, the Department holds that drug products labeled in this manner are misbranded, and interstate shipments of such products are subject to seizure action and the manufacturer liable to prosecution. The chemical analysis of many of these products indicated that the medicinal ingredients were present in insignificant amounts, and that they had practically no physiological activity. Others contained therapeutically significant amounts of ingredients that might properly be labeled as tonics or appetizers. The Administration does not, however, regard products of this character as being capable of increasing egg production. It may be mentioned here that the use of the word "tonic" in the labeling of drug products is considered to constitute misbranding unless the product actually contains therapeutically significant amounts of ingredients known to have tonic properties.

As a result of our activities within the past few years in removing from the channels of interstate commerce products labeled for white diarrhea of chicks, the claims for many of these products were changed to "diarrhea medicine." Some of these products contained astringent ingredients, but since diarrhea is merely a symptom of many diseases, and the use of an astringent will not remove the causative factor, the Administration regards such products labeled as diarrhea remedies as misbranded.

Our work on worthless and misbranded antiseptics for human and animal use resulted within the last few years in the investigation of more than 1,000 products, most of which were tested bacteriologically. The investigation re-

vealed that many manufacturers did not have their antiseptics tested bacteriologically. Some were under the impression that a chemical such as carbolic acid would be antiseptic no matter how weak a solution was used or in what menstruum it was carried. Hundreds of so-called "antiseptic" preparations were found misbranded as to antiseptic properties and bearing false therapeutic claims. In fact, two of the so-called "antiseptics" examined actually contained living bacteria.

Action has also been taken against products labeled as intestinal or internal antiseptics. When we take into consideration the length of the intestinal tract and the resulting dilution of the small amount of medicament with the intestinal contents, it is very doubtful if there is any such thing as an intestinal antiseptic. Furthermore, there is no information based on scientific tests available that there is any justification for such claims. The Administration, therefore, has not hesitated to take action against products labeled in this manner, regardless of the composition. Since so many products represented as intestinal antiseptics for veterinary use, found on the market, contained various forms of sulpho-carbolates, bacteriological tests were conducted more than two years ago to determine whether or not they had any antiseptic action in the presence of serum or other organic matter. The tests showed that products of this character have no antiseptic action in any dilution against *B. typhosus* in the presence of organic matter. As an evidence of the concurrence in this conclusion of contemporary medical opinion it may be of interest to this association to note an answer to an inquiry on intestinal antiseptics appearing in the *American Medical Association Journal* of June 14, 1930, under the heading "No Intestinal Antiseptics."

"TO THE EDITOR:

Is there recognized any drug which, if taken by mouth, constitutes an intestinal antiseptic? If so, is a triple sulphocarbolate such a substance? * * * "

ANSWER: "There is really no such thing as an intestinal antiseptic, if that term is defined as equivalent to disinfectant, there being no known influence capable of killing the micro-organisms in the living intestine. If the term is defined to include inhibition of the growth and diminution in the number intestinal microbes, then diet (milk diet in most adults) would constitute perhaps the most important influence of this kind. Milk mercurous chloride might qualify as an efficient drug with a tendency in that direction. Phenol sulphonates (sulpho-carbolates) are worthless."

The market is particularly flooded with these so-called intestinal antiseptics recommended for the prevention and treatment of disease conditions involving the digestive tract. The Administration has therefore informed manufacturers of drug products that drugs recommended as antiseptics or germicides, to be administered to farm livestock by way of the mouth, and represented as being effective in the treatment of any disease condition involving the digestive tract, are misbranded under the food and drugs act.

There is another class of drug products frequently misrepresented to the public to be taken internally or inhaled as respiratory antiseptics or germicides for the treatment of diseases of the respiratory tract. Most of the chemicals known to have antiseptic or germicidal properties when tested bacteriologically in test tubes are easily rendered inert in the presence of organic matter, such as saliva, digestive material, and serum. Considering the difficulty of reaching the organisms deeply imbedded in the tissue by any chemical to be taken internally, without doing considerable damage to the tissue, we do not see how it is possible for any drug product to be efficacious in this respect. Many scientists have devoted considerable of their time to a discovery of some chemical which could be administered internally and be depended upon for its germicidal effect without being toxic to the tissues of the body. So far, we have no knowledge of any scientist's having discovered such a chemical which can be depended upon for its germicidal

effect when taken internally in the treatment of contagious or infectious diseases of animals.

While the force of the Administration is inadequate to permit it to proceed instantly against all misbranded veterinary products which may be distributed in interstate commerce, approximately 8,000 preparations have been investigated during the past few years, representing at least 400 manufacturers. A large majority of these manufacturers have either voluntarily taken the misbranded products off the market or have revised the labelings or formulas to meet the requirements of the laws. Court actions under the laws are numerous, but the corrections thus obtained are far less than those brought by voluntary compliance with the laws.

The Administration, in the enforcement of the insecticide act, has done, and is doing, much work in making chemical analyses and testing disinfectants bacteriologically. This class of products for veterinary use have been found to contain many unwarranted and misleading statements. The proper use of a premise disinfectant may prevent the spread of disease through one source, and one only; that is, contaminated premises. Communicable diseases are spread principally by direct contact with diseased animals, or with animals exposed to the disease which may not show symptoms of the disease. Where the possibility of contact with the diseased animals or carriers exists, premise disinfectants are incapable of stopping its spread. A label representing a disinfectant as a preventive for various diseases of animals is capable of carrying a false sense of security to a purchaser. The recommendation of a disinfectant to be sprayed around the premise and added to the drinking water to prevent diseases such as hog cholera, Bang's disease or contagious abortion, Pullorum disease (also known as white diarrhea of chicks), roup, etc., leads the user of such a preparation to believe that he has done everything necessary and possible to prevent disease when, in reality, he has covered only inadequately a few of the many possible sources of disease spread. The Administration consid-

ers such representations as misleading and unwarranted. Furthermore, antiseptics and disinfectants recommended for use in drinking water for birds and animals can be effective only in preventing drinking water from spreading disease from one animal to another, and then only for a limited period of time, due to contamination with organic matter. Since this is only one source of possible spread of disease, the recommendation of a disinfectant or antiseptic to be given in the drinking water as a means of preventing the spread of disease is considered too broad, and misleading. Under the insecticide act many other preparations for animals receive constant consideration, such as fly killers and repellants, flea and lice powders and liquids, dips for animals, mange ointments, lotions and liquids, preparations for screw worms and grubs, and for various forms of scabies of livestock. Many farmers and poultrymen have believed it possible that certain chemicals administered as medicine, or mixed with feed or water, may protect their animals from external parasites. Many misinformed and unscrupulous dealers, particularly in the poultry business, have played on this belief. The prevailing idea is that the material is taken up by the blood and then excreted on the surface. Many believe that the parasites are either poisoned in this way or else that a condition is inducted which makes the fowl displeasing to its parasites and causes them to leave. Hundreds of liquids, tablets and powders have been sold for use in this way. The Administration, in the enforcement of the insecticide act, has issued warnings against these remedies, and in many cases has forced the makers through court action, to cease selling preparations of this nature. In approximately fifty tests of the preparations advertised none showed any indications of value against the common external parasites with which the hens were infested. Lice and mites thrived and multiplied as they might have been expected to do if the medicine had not been administered. These tests were the basis of a campaign against this class of products. The Department carried out a considerable number of tests of other

products in addition to those sold on the market as "vermin eradicators." In no case was there conclusive evidence of any benefit from dosage. The ticks, mites, lice and fleas were not eradicated. Furthermore, there is grave danger in giving certain internal medicaments to healthy fowls, as their vitality may be decreased to such an extent that the parasites find them an easier prey than they would have been had no drugs been administered. The conclusion of the investigators is that the use of internal medications against external parasites is detrimental to the poultry industry in that it not only involves useless expenditures but allows the parasites to continue their ravages when they might be destroyed by recognized methods. Poultry raisers who desire to review for themselves the evidence against preparations of this character may obtain *Technical Bulletin 60-T* free, while the supply lasts, by applying to the United States Department of Agriculture, Washington, D. C.

During the past four or five years the Administration has given continuous attention to standard pharmaceutical products to assure a high degree of accuracy in their compounding. The physician and the veterinarian usually have no means of determining whether or not a tablet or capsule contains the amount of ingredient claimed upon the label. A tincture of nux vomica which is deficient in strychnine, may look just like one that meets the pharmacopoeial requirements. Variations from the standards in products of this kind can be determined only by analysis. The Administration has analyzed thousands of samples of these products. Numerous cases, in which the variations from standard have been regarded as exceeding the limits justified by the best commercial manufacturing processes, have been referred to the courts. The courts have indicated their appreciation of the seriousness of the offenses by the imposition of substantial fines.

In answer to a question, Dr. Moskey stated that the Federal Post Office Department has expressed a willingness to con-

sider a protest from farmers concerning the use of wrong advertising methods by companies which offer proprietary veterinary products.

PRESIDENT WOLFE: We regret that Mr. H. L. Albers of Armour & Company's Baltimore office, who had accepted a place on our program to discuss "Some Significant Meat Trade Developments," has been ill and is advised by his physician not to use his voice. We are very sorry that he cannot be with us, but under the circumstances, we are glad he is following his physician's advice, and shall hope to have him present at some future meeting. Mr. William F. Schluderberg, president of the William Schluderberg-T. J. Kurdle Company, is in the room, and, if he will pardon our calling on him without notice, we shall be glad to have a word from him.

MR. SCHLUDERBERG: *Mr. Chairman and Gentlemen*—Your chairman has taken me rather by surprise. My purpose in being with you this morning was primarily to pay my respects to your organization and to learn more about your problems and how we, as meat packers, can co-operate with you for the mutual benefit of yourselves, ourselves, and the public.

I hope you will understand my embarrassment in not being prepared to address you on the subject that was scheduled to be discussed by the speaker who unfortunately was unable to be present. However, I would like to give you a few reflections that have flashed into my mind while sitting here. I believe we still are near enough to the beginning of the New Year that it would be in order to wish you all a happy and prosperous New Year, because I have no doubt that the last year has not been very good to you. In fact, I believe every group of our citizenry have been affected by this era of depression, and it reminds me of a story I heard about the young boy who had secured a job as office boy in a banker's office, and at the end of the week when he approached the cashier for his wages he was told that they

had decided during the week to make him a partner and therefore they had no money for him.

We who are naturally dependent upon the farmer as a source of supply for the products which we convert into marketable products for the consumer, must by necessity be interested in the welfare of the farmer. As packers, our chief job in the scheme of meat distribution is to narrow the spread between the price which the producer gets and the consumer pays, with the hope of encouraging production as well as consumption. Of course, good intentions and theories don't seem to work out in these days of depression, and not everyone, regardless of what business he may be a part of, has been able to obviate or help minimize his own burdens or the burdens of those closely allied with him.

I would like to get this one thought over to you gentlemen here this morning, and that is concerning the activities of the State Development Commission. This Commission was the result of a survey made by the Association of Commerce. The motive behind this survey was that the prosperity of the City of Baltimore is to some extent, dependent upon the prosperity of the State and that what was good for the State of Maryland was likewise good for the City of Baltimore, and vice versa. Also, it was felt that there seems to be an opportunity further to develop the natural resources of the State. At the conclusion of this survey by the Association of Commerce, His Excellency, Governor Ritchie, of Maryland, was consulted, and the outcome was the formation of the State Development Commission which was jointly financed by the State of Maryland and the Association of Commerce. So you see that both the Governor and the business men of Baltimore are very much interested in this project, and they are heartily supporting it. This indicates not only the possibilities, but also that the results already obtained prove the wisdom of this far-reaching undertaking.

Time will not permit me, nor am I prepared, to give you a lengthy resumé of this work, but I would suggest that at a future meeting of your organization you take advantage

of the opportunity to learn more about the work of this Commission so that you may be in a position to determine its usefulness and how this Commission may serve your particular interests. I may state that one of the activities which the Commission is justly entitled to the credit of initiating, was the Baltimore Live Stock Show with which all of you men here, I am sure, are familiar. I believe you are in a good position to evaluate and appreciate its value to the live stock interests. It is needless to say that our company was very much interested in the success of this show and those for whom this show was provided, as evidenced by the financial support and the large expenditures made by the Esskay Company to assure its success.

PRESIDENT WOLFE: As we still have a little time at our disposal, it seems that we might well take up the Round Table which is scheduled for tomorrow morning. The general subject is "My Most Satisfactory Live Stock Experience."

In the brief time used for this discussion, Mr. Charles T. Cockey, of Baltimore, stated that his most satisfactory livestock experience of 1931 was his decision not to fatten some cattle that he had purchased for that purpose. Mr. Stanley Stabler told briefly of his work in the production of fattening early lambs for the Washington market; he stated that 42 lambs had already been dropped, and that sometimes the buyers will take lambs that weigh as little as 35 pounds. President Wolfe told of having sold 22 white faced steers for 18c per pound in 1919, and of getting 15½ cents per pound for a yoke of oxen during the same year; 12 of the steers were raised by Mr. Wolfe, the other 10 had been purebred in Chicago.

PRESIDENT WOLFE: Mr. Glascock of Virginia, is in the room, and I shall ask Mr. J. W. Jones to introduce him.

MR. JONES: Mr. Thomas B. Glascock, of Upperville, Virginia, an extensive farmer and livestock producer of Upperville, Virginia, and a director of the Eastern Live-

stock Co-operative Marketing Association, Inc., has found time to attend our meeting this morning, and I am indeed glad to present him to this group, and to ask him to say a few words.

MR. GLASCOCK: *Mr. Chairman*—It is, indeed, a pleasure to be in this company this morning, and to bring greetings to you from Virginia stockmen. I shall not take much of your time, but you may be interested to know that, in my judgment, there is a growing demand for highly finished light cattle, instead of for the heavy cattle which formerly were so extensively produced by our Virginia cattlemen. I am conducting my feeding operations with a view of supplying fat steers for this demand, and I believe that we must, as cattle breeders, and feeders, see to it that our finished product appeals to the consuming public, upon whose purchase our profits must depend. It is a pleasure to be in Maryland, and I have enjoyed meeting you here today.

Session adjourned.

SECOND SESSION

The Wednesday evening session was held at the Claremont Hotel at the Union Stock Yards as a dinner-meeting. After the excellent dinner was over, President Wolfe introduced M. J. H. Baugher, president of the Union Stock Yards Company.

Mr. Baugher welcomed the association to the Stock Yards, referred to his own vital interests in the livestock industry, which has for years occupied his attention, and stated that the Stock Yards officials and every commission firm doing business at the yards always welcomed an opportunity to be of service to the livestock industry of the State. Mr. Baugher's brief address was characterized by a sincere expression of regard for the Association and a cordial hospitality that contributed much to the success of the evening meeting.

President Wolfe next introduced the Mayor of Baltimore, Hon. Howard W. Jackson. Mayor Jackson cordially welcomed the Maryland Stockmen's Association to Baltimore. He commented upon the prosperous appearance of the stockmen present and predicted that, when savings had been sufficient to counterbalance the enormous wastes resulting from the World War, better times would prevail. This was the first time Mayor Jackson has attended a Stockmen's Association dinner-meeting, and both he and the association seemed to enjoy the experience.

PRESIDENT WOLFE: The matter of financing livestock operations is of interest to many farmers. Mr. C. J. Parkinson, a banker of long experience, now assistant manager of the Federal Intermediate Credit Bank of Baltimore, and a man who is interested in the matter of financing agricultural enterprises, will discuss the financing of livestock operations. Mr. Parkinson attended our meeting last year as a listener, and we shall be interested in listening to him tonight.

FINANCING LIVESTOCK OPERATIONS

By J. C. PARKINSON, Assistant Manager,
Federal Intermediate Credit Bank of Baltimore.

Mr. Toastmaster and Gentlemen:

In years like the present one, when farmers have grown such an abundance of feed, the feeding of cattle has presented itself more than ever before as a profitable outlet for this surplus. Financing the purchase of live stock is often beyond the resources of the general farmer, and the problem of such financing is a very necessary feature to be considered.

In this section of the country, numerous strong local banks have heretofore, in normal times, been able to handle this type of financing to advantage. However, during the recent unsettled financial conditions, they have been unable to do as much as formerly along these lines.

The Federal Intermediate Credit Banks were created under the provisions of the Agricultural Credits Act of

1923 and have, since that time, been operating to finance agriculture. These banks are owned and operated by the United States Government and were created for the purpose of providing agricultural credit at reasonable interest rates for periods between the usual maturities of short term commercial bank loans and long term farm mortgage loans.

The Intermediate Credit Banks obtain a large proportion of the funds they lend by selling tax-free debentures which are secured by the loans which have been discounted. They must pay interest on these debentures promptly when due. The notes securing these debentures, therefore, must be of just as good quality as the notes discounted by the Federal Reserve Bank and used as a basis on which to issue currency.

Under the law, the discount rate of a Federal Intermediate Credit Bank may not exceed by more than 1% the interest rate borne by its last issue of debentures. The rate of discount of the Baltimore Bank has varied from 3¾% last July to a present rate of 5¼%. The law does not permit Federal Intermediate Credit Banks to make loans to individuals or to discount paper for individuals directly. Intermediate Credit Banks are authorized to make loans to banks and agricultural credit corporations.

In localities where existing credit facilities are inadequate, agricultural credit corporations may be formed. These corporations may be formed by three or more individuals with a minimum paid in capital of $10,000 and should be organized under the general corporation laws of the State in which they are to operate. When properly organized with sufficient paid-up capital and managed by competent personnel, such corporations may be granted the privilege of discounting loans with the Federal Intermediate Credit Bank serving the district in which they are located.

When an agricultural credit corporation, after having been organized, wishes to discount with the Federal Intermediate Credit Bank eligible loans made for agricultural or livestock purposes, it should file with the Federal Inter-

mediate Credit Bank in its district an application in writing for the establishment of discount relations. Forms of application may be obtained from the Federal Intermediate Credit Bank.

The capital stock of the corporation should be partially invested in securities acceptable to the Federal Intermediate Credit Bank as collateral to whatever line of discounts which may be granted. On the basis of the collateral pledged under trust agreement with the Federal Intermediate Credit Bank the bank will rediscount for a corporation from three to five times this amount determined in each instance on the character of the paper offered, the security therefor, and the management of the corporation. The paper offered for discount by the credit corporation must be what is known as agricultural paper, that is, the proceeds must be used for an agricultural or livestock purpose. The law and regulations place certain limitations upon the amount of paper which may be accepted from any borrower, which is ordinarily 20% of the endorsing corporation's paid up and unimpaired capital and surplus, and in secured livestock loans, 50% of the unimpaired capital and surplus. The maturities of notes acceptable for rediscount may be as long as one year, and in the case of dairy notes, which are made on a monthly payment basis, as long as eighteen months. Loans, to be acceptable for discount by the Intermediate Credit Banks, must be good loans, well secured, and made by responsible farmers and stockmen and are expected to be self-liquidating.

The Federal Intermediate Credit Bank is a bank of discount which must get back with interest what it invests in notes of the farmers and stockmen and get it when the notes are due. Officers of credit corporations, who are approaching the bank with that understanding and handling their business on that basis are finding the Federal Intermediate Credit Bank quite useful in financing the operations of stockmen. It is necessary that officers of credit corporations be familiar with the forms used in securing loans and that they be properly drawn and that

also only well secured loans, capable of being liquidated by the sale of the cattle taken as security, be made.

There is not sufficient margin in the operation of an agricultural credit corporation for any losses, and loans not adequately secured, even were it possible to discount them with the Federal Intermediate Credit Bank, would react to the disadvantage of the credit corporation when due.

To give an idea of the possibility of handling livestock paper through a Federal Intermediate Credit Bank, the Federal Intermediate Credit Bank of Wichita, Kansas, which includes in its territory large cattle interests, had, on November 30, 1931, a total of livestock loans discounted of $2,399,518. As the Federal Intermediate Credit Banks are thus shown to be in position to handle properly secured cattle paper, it would seem desirable that cattle interests go thoroughly into the question of this financing and endeavor to avail themselves of this service.

Any persons interested in the formation of a credit corporation for the purpose of financing cattle loans, may obtain other information desired from the officers of the Federal Intermediate Credit Bank of Baltimore, 24th and St. Paul streets, who will be glad to give any assistance possible in the formation of an agricultural credit corporation.

PRESIDENT WOLFE: Tonight we are favored with the presence of Hon. Renick W. Dunlap, Assistant Secretary of Agriculture. Secretary Dunlap is a farmer himself—a livestock farmer—and the son of a livestock farmer. He is a graduate of the Ohio University, where he studied agriculture and played football—both successfully. He has served his State as State Senator, as Dairy and Food Commissioner, and as Farmers' Institute lecturer. His practical experience as a farmer, his wide study and observation, and his official experience in Ohio, and as Assistant Secretary of Agriculture have provided him with a fund of information that makes it possible for him to discuss intelli-

gently his topic for tonight, which is "The Livestock Industry as a National Asset." Mr. Secretary, this is a topic that is of interest to all of us.

THE LIVESTOCK INDUSTRY AS A NATIONAL ASSET

By HON. RENICK W. DUNLAP,

Assistant Secretary of Agriculture

Mr. Toastmaster and Gentlemen:

As I meet with you livestock men of Maryland here in Baltimore tonight, I recall that Baltimore was one of the earliest livestock markets in our country. In a round-about way I feel that I have a personal interest in the Baltimore livestock market. My interest comes in this way—my great grandfather, George Renick, was one of the first livestock men in the Middle West to drive fat stock from Ohio over the old National Trail to Baltimore for market and export. His activity along this line started a movement which resulted in great herds of livestock being driven to this city for slaughter and for foreign trade. I therefore feel that my family had a part in developing the Baltimore livestock market. The part that Baltimore has played in our livestock market and foreign trade has been by no means small. The outlet for livestock and meat products through Baltimore gave stimulus to the livestock industry in the Middle West and the West which resulted in its expansion and development into the leading industry of agriculture today.

Because the livestock industry is and has always been such an integral part of American agriculture, probably few of us have ever given extended thought to the question of the economic importance of the livestock and meat industries as a national asset.

This importance can, perhaps, be best appreciated by imagining the situation of agriculture in this country if we were a nation of vegetarians and production of meat animals had no place in our agricultural practice. This might be no vain imagining since there are large areas of the

present day where agriculture is devoted almost entirely to crop production and where animal husbandry is almost non-existent. With the development of mechanical power for farm machinery, displacing the horse and mule as a source of power on the farm, there are many farms in the country today where the only livestock is a milk cow or two, and not infrequently these are displaced by a can opener and a case of condensed milk.

What then would be the situation of agriculture without livestock? In the first place, there would be a great reduction in the number of farms and the number of people engaged in agriculture—and probably farm land values would be even lower than they are now. Of the total acreage in crops in this country (around 360,000,000 acres harvested in 1930), over 65 per cent, roughly, was devoted to raising products used largely or exclusively as feed for livestock and 35 per cent to products used for human food, for fibers or for industrial uses. This does not include pasture land in farms, which in 1930 exceeded crop land in the total acreage, nor range and pasture land not in farms which in many of the western States exceeds the total area in farms.

While a portion of the animal feed crops, such as corn, oats and barley, are used for human consumption this is probably more than offset by the by-products of the human food and fiber crops that are fed to livestock, such as wheat straw, flour by-products, cotton seed, linseed products, beet tops and pulp, and cotton stalks.

Still using round numbers, it is apparent that of the 987,000,000 acres in farms in the United States, as shown by the census of 1930, around 70 per cent was devoted to the production of products that were or could be utilized only by livestock, including poultry. In addition to this, vast areas of other lands not in farms were or could be only thus utilized.

Today livestock production is the framework around which American agriculture is built, and all of our agricultural practices and theories are being developed largely upon the assumption of the continuation of this situation.

With such a large part of our farming area devoted to livestock production it may be of interest to learn what is the value of this production in relation to the total agricultural production. According to estimates of the Department of Agriculture the total value of the production of meat animals (cattle, hogs and sheep) as meat animals, in 1931 was $2,488,000,000, while the value of the by-products (wool and mohair) was about $71,000,000. In addition,—the value of dairy products was $1,854,000,000, making a total value of meat animals and their products of $4,412,-000,000.

The total estimated farm values of all agricultural products in 1930, which included the value of all crops, livestock and livestock products was $9,300,000,000. Meat animals and their products comprise 32 per cent of this total. Including the value of poultry and poultry products, and horse and mule production, the livestock industry made up 40 per cent of this total value of all agricultural products.

Perhaps the size and importance of the meat industry of the United States can best be realized when it is compared with some of the other major industries of our country. According to the last census figure of 1929, the auto industry's output was valued at $3,722,000,000. Steel work and rolling mills $3,395,000,000; foundry and machinery $2,751,000,000, and petroleum refining $2,611,000,000. Compare any one of these figures with the value of meat animals and their products alone, which amount to $4,412,-000,000 and we see that our livestock industry is by no means a small one. The total value of all agricultural products amounting to $9,300,000,000 in 1930, easily dwarfs all other industries in our country.

We have, thus roughly two measures of the importance of livestock, including poultry, in the agricultural system of this country. Seventy per cent of the area in farms, and an additional large area not in farms, utilized for the production of feed for livestock, and 40 per cent of the total value of all agricultural production coming from livestock.

These comparisons, however, do not indicate the importance of livestock in the actual farm practices as they now exist. There is the whole broad field of the relation of livestock production to fertility, the maintenance and upbuilding of the productive capacity of all agricultural land. It is true that in large part the fertilizer by-product from livestock production is devoted to lands actually used in livestock production. On the other hand, the productivity of these lands is being maintained or increased for the day when they may be needed for more intensive production and at the same time they are contributing year by year a material proportion of the total requirements for human food.

From the point of view of farm management livestock production makes possible a more efficient use of labor and equipment, a better distribution and greater stability of income, and usually a higher return for capital investment and labor costs.

From the standpoint of national economy it makes possible the utilization of vast areas of land which otherwise would be useless. Many of our western States would be largely uninhabited except for the possibilities of using the grasses and forage that grow in the semi-arid desert and mountain areas for the production of livestock.

In addition to the economic importance of livestock production it has a social value that cannot be measured. The love of man for the land, in large part, is the love for the animals associated with the land and the life lived in constant contact with these animals. While there is, doubtless, a proportion of our progressive farmers whose interest in farming is entirely in the field of plant production, I think it can be fairly stated that in general the men most strongly attached to the occupation of farming and the most active and progressive in agricultural affairs are those whose largest interests are in animal husbandry.

Disassociate livestock production from agriculture, and life on the farm would be a dreary affair to a large part of the men now most passionately devoted to farming careers. This would be especially true of the boys on the farms whose

first attachments to farm life come from their association with the animal life of the farm and whose acquisitive and property instincts usually develop around the ownership of a calf or a colt or a pig. The boys most likely to stay on the farm are those who are fond of horses, who like to handle cattle, or who are interested in feeding the hogs or caring for the sheep, rather than those who have a deep interest in cultivating corn, shocking wheat or pitching hay.

In general terms I have shown the importance of the livestock industry to agriculture; what of the economic importance of the meat industry to agriculture. Obviously, the farmer is interested in the meat industry as furnishing the means by which his meat animals are converted into meat and other products and distributed to the ultimate consumer. The performing of these functions is no simple process but is one that requires an efficiency in organization, administration and operation, second to no other devoted to supplying a major want of the consuming population. While on the one hand the livestock industry furnishes the raw material for the meat industry, on the other hand the organized meat industry furnishes the farmer with the only outlet for his meat animals over and above what he can use for his own consumption. Before the development of transportation and the wide separation of producing areas from consuming centers the process of marketing livestock products was comparatively simple; now it requires an organization on a national and even international scale.

In the final analysis the amount the farmer receives for his livestock is the amount that the ultimate consumer pays for all the products derived from livestock slaughter less all intermediate charges for distribution, transportation, and processing. The more products that are derived, the greater the total value of the carcass—so the farmer is interested in having every possible use made of every part of the carcass. The less the cost of processing and distribution the more will be the farmer's share in the proceeds of ultimate sale—hence the farmer is interested in all devel-

opments in the industry making for greater efficiency in all these lines, be it improved technique in processing, better methods of transportation, or reduced costs in retailing.

The producer of livestock is dependent almost entirely upon the meat industry for influencing the consumer demands for meats. To a limited extent, through such agencies as the National Livestock and Meat Board, producers contribute to the joint project of encouraging the demand for meat. But this demand is mostly effected by the methods by which the supply is displayed and handled, by retail and packer, advertising and by all similar methods by which consumer habits are changed or prejudices eliminated. The producer's part of the enterprise is to produce an amount and a quality of meat that will meet consumer requirements at a price that will return a profit to the producer and not be prohibitive to the consumer. In this he has even more vital interest than has the meat industry. And for this reason he should be interested in preventing wide fluctuations in production with consequent wide fluctuations in prices.

With our livestock industry of so great importance it naturally follows that a large part of the activities of the United States Department of Agriculture as well as of the Agricultural Colleges and State Departments of Agriculture, are devoted to this industry. The largest bureau in the U. S. Department of Agriculture is the Bureau of Animal Industry with its many and varied activities covering research in animal husbandry, disease control, health inspections, enforcement of sanitary and quarantine regulations, enforcement of laws and regulations governing livestock transportation, and operations of livestock market agencies, stockyards and packing plants, and its nation-wide inspection of meats and meat products.

In addition the Bureau of Agricultural Economics has its Division of Livestock, Meats and Wool, which maintains a nation-wide livestock market news service and meat market news service; establishes grades for livestock and meats and carries on research into varied problems of marketing

livestock and meats; also the Division of Crop and Livestock Estimates which prepares the Department's estimates on livestock numbers, market supplies, and production; and lastly the outlook work of the whole bureau which has for its objective the better adjustment of livestock production to consumptive demand. The results of all of this research of the Department along all lines both in Washington and at the various experiment stations, is carried back to livestock producers by the extension service through the county agents and extension specialists, and by the publicity and publication departments in news releases and publications.

A discussion of a national asset as important as the livestock industry is scarcely complete until some comment is made of the Federal legislation concerning the industry. I need not take the time of you men to discuss with you the Agricultural Marketing Act. The fact that you are here and are interested in solving the livestock problems of your State in an organized way is sufficient evidence that you have already come in contact with the activities of the Federal Farm Board and know of the great amount of assistance it is rendering all farm organizations.

It may not be out of place, however, to mention briefly our agricultural tariff law. I mention the last Tariff Act as an agricultural law and the reason why I am certain that it is an agricultural tariff law is the fact that agricultural rates computed ad valorem are 51.6 per cent higher than those in the 1922 tariff law, while the rates on industrial products computed on the same basis are only 14.6 per cent higher.

It is well known that China can sell eggs in New York cheaper than our poultrymen can or should produce them; Argentina can sell beef in New York cheaper than our cattlemen can produce it; Australia, Holland, and Denmark can sell cheese, butter and various forms of milk in New York cheaper than our dairymen can or should produce them. The only possible way, therefore, for us to keep our own markets for ourselves and to protect our American

farmer is to keep foreign farm products out by means of a protective tariff. To some the last tariff law fixes the rates entirely too high. You livestock men, however, will be interested to know that for the first eleven months of the fiscal year ending June 30, 1931, our imports of agricultural products exceeded our exports by $68,500,000 dollars in spite of the so-called high tariff rates.

To be sure these figures include some non-competitive articles. However, it may surprise you to know that we are importing meat and meat products which require 341,000 acres to produce; dairy products and by-products, 453,000 acres; cattle, hogs and sheep, 818,000 acres. in other words, if these imports could be grown in the United States instead of some foreign country (and they could be) it would mean that more than a million and a half acres of our land could be producing crops which could be consumed in the United States. Other crops are being imported that are displacing millions of acres of our land. We are importing vegetables which require 388,000 acres to produce; soy beans, 160,000 acres; corn, 84,000 acres; peanuts, 67,000 acres; figs, 62,000 acres; and flax, 2,300,000 acres. In all, if we grew here at home the products that we now import it would mean that some ten million acres, an area greater than that of the State of Maryland and Delaware combined, could be producing crops which could be consumed in the United States. These facts seem to indicate that it behooves the livestockmen of our country to support our tariff laws. If it is possible for foreign producers to come in and take part of our markets from us in spite of the relatively high tariff wall, what could those same foreign producers do to our markets should our tariff wall be materially lower?

In concluding, I should like to remind you men who are members and officials of this State Livestock Association that your duties and responsibilities are great. The livestock industry of Maryland is by no means a small industry. It is of such size that it is capable of dwarfing the largest commercial industry in the State. In 1930, the value of livestock and livestock products in the State of Maryland,

produced by some 43,000 farmers, was $45,500,000. To be sure, not all of this volume of business will come under the direction of your organization, but a sufficiently large percentage of it will move through your organization so that your task as directors and officers of the organization is by no means small and insignificant: your organization has a real purpose and duty to perform for the livestock industry of Maryland. With the interest and enthusiasm manifested here this evening I feel certain that through you your organization will do credit to the problems that confront it.

PRESIDENT WOLFE: Maryland stockmen are interested in State, national, and international livestock developments. Tonight, Dr. Wm. R. Crawford, who is engaged in tuberculosis eradication work near Westminster, has consented to talk to us for a little while on "Some Livestock Observations in Scotland and in America." Dr. Crawford, is a native Scot, a graduate of Cornell University,—and a devotee of that genuinely Scotch musical instrument—the bagpipes. He is here in Highland costume, and has his musical equipment with him. He will play for us and will speak to us.

Thereupon Doctor Crawford played a number of characteristic tunes and told stories in the way that only native Scots can play tunes and tell stories. His pleasing, unusual contribution of music and anecdote will not soon be forgotten by his appreciative audience.

SOME LIVESTOCK OBSERVATIONS IN SCOTLAND AND IN AMERICA

By DR. WM. R. CRAWFORD,

Westminster, Maryland

Mr. Toastmaster and Gentlemen:

The livestock industry varies greatly in various parts of Scotland according to the topography.

The south of Scotland is a vast fertile, rolling lowland

broken by still more fertile river valleys. Here most of Scotland's industries are wrought, and here the lion's share of the population live.

This concentration of population as well as the high price of the land demands a very efficient agriculture especially in animal husbandry. In these lowlands the Clydesdale horse was developed as a cart horse, for most of the farm draught is done in two-wheeled carts drawn by one horse, or if necessary several horses hitched tandem. With the Clydesdale horse, you are likely all familiar, he is a large rangy horse, sixteen or seventeen hands high; usually bay or light brown in color with white markings; one of his outstanding features is the "feather" below the knee and hock. This feather seems to be objectionable to an American horseman, but in the moist soil for which he was developed it is his protection. The real draw-back which the Clydesdale horse may have, if he has any, is the tendency in some families to be thin in the flanks, "wasp-waisted" as we were taught to call them, and again some families are short rumped, very sloping, these we were taught to call "goose rumped," but these characteristics are being bred out until they are not longer generally found, and the Clyde is as symmetrically built as any of the draft breeds. While there are farms in Scotland devoted entirely to horse raising, the great bulk of Clydesdales are raised by small farmers, who have several mares to do the farm work. These mares are bred to local stallions either co-operatively owned or privately owned. The offspring are raised along with other farm animals, in conjunction with other farm work and sold off as a cash crop.

Motor power has not yet made the serious inroad upon Scotch horsepower which it has in America, and this fact along with the fact that in Scotland most cities are seaports, where immense amounts of drayage is done, renders the Scotch horse market reasonably good. The Clydesdale, besides being a large and powerful horse, is also a particularly gentle horse. I was once upon a farm which kept five or six stallions. These stallions were stabled together side

by side, they ate out of a long continuous manger, each with his own grain box, however. They were tied with rather long halter shanks which ran through an eye in the manger and attached to weights about the size of a croquet ball. The weights hung loose along the outside of the manger next to the stall and took up the slack in the halter shank at all times. The only partitions between the horses was a four by four, hooked over the mangers in front and suspended by a chain from the ceiling in back. If such an arrangement were used in this country even with mares and geldings there would be a horse kicked to death every night!

The south of Scotland also produced the Ayrshire cow, which is a Scotchman's idea of beauty and dairy efficiency; but this is solely a dairy project, and you may not be particularly interested.

In the very southwest of Scotland, where the Solway flows into the Irish Sea and where cold sea-winds sweep the land a good part of the year, the Galloway cattle were developed. These cattle are peculiar in that they have two hair coats, an inner coat which is soft and silky and an outer coat which is long and tends to be curled. The color is generally black with reds and duns occasionally. Galloway hides are very much in demand at home for overcoats, rugs, and laprobes. Galloway cattle are considered to be the hardiest cattle of the British Isles. When it was found that the Scotch Highland cattle were unsuited for northwestern Canada along the Mackenzie River on account of their horn cores freezing and causing sloughing, these were replaced by the polled Galloway.

In the higher portions of the lowlands and in those parts less arable, sheep raising is carried on extensively, so extensively that there are supposed to be five sheep for every man, woman, and child in the kingdom. So you see it means quite an industry.

All the British breeds of sheep are raised, more particularly the Cheviot, which is by far the most popular breed. The Cheviot is a medium sized sheep, comparable to the Shropshire in size, with white wool, white-faced, white-

shanked, and with black hoofs. He is blocky in build and has medium wool some two or three inches long, grading about a fourth to three-eights blood, and the wool forms a kind of collar about the neck. He is a good rustler, and on the Cheviot hills and the midlands, gains himself a good living on the native grasses, even in winter time pawing away the light skiffs of snow and doing fairly well.

The northern part of the lowlands is known as the Midlands, these are rolling foothills rising into the Grampian hills, and here it is that Scotland's ascendency in stock-raising began. Here the Cruickshank brothers made their contribution to the improvement of Shorthorn cattle, and here also is the "Doddie."

The Doddie or "Humblie" as the Aberdeen-Angus cattle are called in Scotland, are well known Scotch cattle, for they have been distributed to the four corners of the earth.

The problems of livestock raising in Scotland are many, and shelter is one. Scotland is a land of stone, stone houses, stone barns, or "byres" as they are called, and stone fences. There is little timber and hence no very cheap buildings, so the farm buildings are used mostly for housing farm products and machinery, and the livestock have been bred with the fact in view that they must of necessity shift much for themselves on the outside in all seasons and in all kinds of weather.

Feed is always a problem in livestock industry, as you very well know from last year's experience, and in Scotland this is particularly so at all times. Remember, Scotland has no Indian corn, consequently she has no shelled corn or corn meal except what she imports, and of course no corn silage or fodder.

She is, however, a land of small grains, rye, oats, and barley with some wheat, but chiefly oats. The people eat it, and the cattle eat it. Excellent hay, both timothy and mixed, is raised along with enormous numbers of turnips, "neeps", as they are popularly called.

Of the root crops, mangels are the most popular, they seem to yield better, and due to the fact that they grow

well out of the ground, are more easily cultivated and harvested. Mangels are less likely to taint the milk of dairy cattle with a turnip taste than are roots of the turnip family. They have several drawbacks, one is that they must be cured or else they will scour animals, another is that if fed to sheep they will produce kidney stones in the rams and wethers, that is, of course, within reasonable limits.

Swedish turnips, "rutabagas", or yellow turnips, are especially popular as well as white turnips, for both of these can be used as human food as well as for animal forage.

Oats, turnips, and hay are the salvation of the beef industry of Scotland, for thousands of "Doddies" are brought in from summer and fall pasture and fitted for slaughter on nothing more than turnips and oat straw; if the farmer wishes a little more finish, he will probably add a little oat hay along with a little imported linseed or cottonseed cake, and here is an interesting thing, for all corn meal, linseed or cottonseed cake which a tenant farmer buys, he receives a reduction in his rental at the end of the year.

One cannot cease speaking of the sheep industry of Scotland without mentioning the shepherd's dog, the Collie. The working Collie of the old country is not the slim, trim, long-nosed, long-headed, American bench show Collie with which we are now mostly familiar. He is a stocky, muscular, long-nosed, wide-headed dog, not always beautiful, but "powerful useful." Many wondrous stories are told of his sagacity in handling sheep; whether all these be true I cannot rightly say, but the amount of intelligence he has and the perfect knowledge of sheep nature he shows when helping the shepherd handle large bands of excitable sheep are almost unbelievable.

The north of Scotland is a mountainous district given over chiefly to deer parks and hunting preserves; however, nestled in these mountains are numerous little lakes and streams along which are situated villages of a few houses each. These people have a peculiar agriculture of their

own, based chiefly on oats and turnips, and moorland pasture belonging to somebody else.

Here is the home of the oldest breeds of cattle and sheep in the British Isles, namely "The Highland Cattle" and the "Highland Sheep." The sheep are said to have swum ashore in 1588 when the Armada went to pieces off the coast of Scotland. The Highland cattle are known to have existed in 1503, in James the Fourth's reign.

Both cattle and sheep are wild, spending almost their entire existence on the outside. The winters are spent on ranges in closer to the farm properties where they both paw away quite heavy snows and eat the green twigs of heather and gorse. In the summer they are fed on grounds farther away and brought in each night to closer pastures by a shepherd.

The Highland sheep is a small animal, the rams weighing about 120 to 150 pounds; the rams have spiral horns; the ewes have curved horns; both rams and ewes have black faces, black shanks, long, coarse, flowing wool. The wool is of poor quality used mostly in the manufacture of blankets and carpet. The Highland sheep is pre-eminent as a mutton producer. The Highland cattle produce some of the finest beef that enters the English market.

PRESIDENT WOLFE: The announcing of the results of the 1931 Maryland Litter Contest is next on our program. This is always an interesting feature. This Association and the University of Maryland Extension Service co-operated in the organization of this contest, and for some years the Esskay Company of Baltimore has offered substantial cash prizes to State and County winners. I shall ask Dr. T. B. Symons, director of the University of Maryland Extension Service, to take charge of this part of our program.

THE 1931 MARYLAND LITTER CONTEST RESULTS

DR. T. B. SYMONS, Director Extension Service

University of Maryland

Mr. Chairman and Friends Representing the Livestock Interests of Baltimore and Maryland:

I am indeed glad to have the opportunity again to present the winners of the Maryland Litter Contest who have so successfully completed their work under the rules of the contest during the past year.

I think you will all agree that there never was a time when greater emphasis should be placed upon the necessity of low-cost pork production. The fact that 12 of these capable hog raisers whose entries reached the goal of at least 1,500 pounds at 150 days of age, brought their litter entries to an average weight of 2,005.75 pounds at 150 days illustrates something of the possibility of economical pork production. While we may not hope for an enormous increase in the pork production of our State, there is an opportunity for considerable improvement in our hog industry, through the adoption of more efficient production methods such as are pointed out in this contest.

We should see to it that more feed is raised so that our hogs can be raised mainly on homegrown feeds. Attention should be directed to the objectives of our Five Year Agricultural and Rural Home program which calls for the following.

(a) Increase the practice of selling cereal crops through feeding them to hogs and other livestock rather than selling them for cash.

(b) Increase hog production to the extent that each farm grows enough pork for its own consumption, and increase production 10% in sections where conditions warrant.

(c) 20% of all hog owners practicing the McLean County System of parasite control.

(d) 20% of hog growers finishing and marketing their hog crop at around 6 months of age.

(e) Continue the present program for control of hog cholera by inducing at least 75% of swine growers to use preventive and sanitary measures as recommended in the Maryland plan for control of this disease.

The winner of the 1931 Maryland Litter Contest—the seventh consecutive litter contest held in this State—are as follows:

First State and first Howard County, Messrs. J. Iager and son, of Howard County, with a litter that weighed 2,563 ½ pounds at 150 days of age. As winner in this contest, Messrs. Iager retain for one year the custody of this silver cup from the Maryland Agricultural Society—The Maryland Farm Bureau Federation. Last year Messrs. Iager won first State prize, and, according to the rules governing this cup award, they now have two "legs" on the cup; one more winning will secure for their permanent ownership of the cup. I shall ask Mayor Howard W. Jackson to present this trophy to Mr. Maurice Iager, representing Messrs. Iager and Son.

MAYOR JACKSON: It gives me very great pleasure to present you this cup in recognition of your having won first place in the 1931 Maryland Litter Contest. Not only am I glad to make the presentation, but if you desire it, I shall provide police protection to insure your safety on your trip home with it.

MR. IAGER: Thank you.

DIRECTOR SYMONS: It is a source of great satisfaction that the Wm. Schluderberg-T. J. Kurdle Company has continued for the third year, their fine cash prize offers. In your hands are sheets that give information concerning the winners of 1931 State and county prizes.

Mr. W. K. Freiert, director of Public Relations for the Wm. Schluderberg-T. J. Kurdle Company is with us tonight, as was the case last year, and will present the winners with cash awards from his company. I now take great pleasure in introducing Mr. Freiert.

PRESENTATION OF CASH PRIZES, MARYLAND LITTER CONTEST

MR. W. K. FREIERT, Director, Public Relations Division, The Wm. Schluderberg-T. J. Kurdle Company

Mr. Toastmaster and Gentlemen:

It is, indeed, a genuine pleasure to be a guest at your banquet tonight for two reasons. In the first place, it gives me an opportunity to enjoy your hospitality and the splendid dinner we have just had and, in the second place, to present to the prize winners in the Maryland Litter Contest, the cash prizes that are awarded by the Schluderberg-Kurdle Company each year.

In connection with the awarding of the prizes I want to take issue with some of the previous speakers who spoke about the depression as it affected your industry and others, because I know of at least eight who were not so hard hit. While others were standing around and talking about the depression, these gentlemen were busy raising hogs, and it is because of their success that I am here tonight.

The company I represent, the Schluderberg-Kurdle Company, is a Maryland institution, founded, developed, owned and operated by Marylanders, all of whom have the interests of the stockmen at heart. I feel that tangible proof of their interest is shown in their donation, which finances the prizes for the Maryland Litter Contest each year.

The president of our company, Mr. W. F. Schluderberg, is a member of the State Development Commission. Largely through this association, he learned the tremendous possibilities of the livestock industry in this State.

Last year, our firm slaughtered approximately 400,000

hogs. Of this number, only a small portion came from Maryland. You can understand the reason for this when you consider that the total hog population in the State of Maryland last year amounted to approximately 131,000 head.

We, who make our money here, are trying to spend it here by encouraging stockmen to produce more for the Baltimore market. Our interest in the Maryland livestock men was also manifested last Fall when it was our privilege to support the Baltimore Livestock Show even to a point where it actually hurt. We purchased about two-thirds of all the cattle which went into the show ring.

In congratulating the winners, I want to assure you that finer hogs were never raised. We purchased some of the prize winners, and I hope their owners will tell you of their success so that more of you will be incouraged to enter in these contests. It is now my happy privilege to make the awards to the prize winners.

Entries in 1931 Maryland 150-day 1,500-pound Litter Contest

Owner	County	Pigs in Litter	Date Farrowed	150 Days Old on
Benj. A. Watkins, III	Anne Arundel	13	May 11	October 8
Benj. A. Watkins, III	Anne Arundel	10	May 13	October 10
J. R. Baldwin	Baltimore	11	April 10	September 7
C. B. Chilcoat	Baltimore	11	April 2	August 30
McDonogh School	Baltimore	10	March 27	August 24
McDonogh School	Baltimore	12	March 10	August 7
McDonogh School	Baltimore	12	April 9	September 6
Guy Nelson	Baltimore	12	June 2	October 30
H. E. Beard	Carroll	13	May 16	October 13
J. S. & E. T. Cullen	Cecil	12	March 1	July 29
R. T. Wilson	Cecil	10	April 13	September 10
C. A. Kuehnle	Dorchester	8	March 31	August 28
C. A. Kuehnle	Dorchester	10	April 4	September 1
C. A. Kuehnle	Dorchester	8	March 20	August 27
Franklin Smith	Frederick	11	February 26	July 26
Richard Zimmerman	Frederick	10	May 27	October 24
E. F. Garletts	Garrett	9	April 27	September 24
H. Jones Baker	Howard	10	May 9	October 6
C. C. Cissell	Howard	10	April 7	September 4
C. C. Cissell	Howard	13	April 10	September 7
Charles Franklin	Howard	12	February 26	July 26
Charles Franklin	Howard	9	March 28	August 25
R. W. Farmer	Montgomery	10	April 11	September 8
Paul M. Gaver	Howard	11	March 7	August 4
John Iager & Son	Howard	12	February 17	July 17
John Iager & Son	Howard	10	April 16	September 13
Ellsworth Linthicum	Howard	11	May 14	October 11
Ellsworth Linthicum	Howard	10	May 21	October 18
Ernest Miles	Howard	8	June 11	November 8
Wilbur Smith	Howard	10	March 27	August 24
R. W. Farmer	Montgomery	12	March 24	August 21
Stanley Stabler	Montgomery	10	April 20	September 17
Francis Bryan	Talbot	9	May 9	October 6
Charles Cowbly, Jr	Talbot	7	April 29	September 26
Hutchison Bros	Talbot	9	April 16	September 13
Jesse J. Hurd, Jr	Kent	8	June 28	October 25
O. E. Yerkey	Kent	9	April 7	September 4

1931 Litter Contest Results

Following is a list of successful entrants in the 1931 Maryland Litter Contest, the goal of which is the production of a litter of pigs to a weight of at least 1500 pounds at 150 days of age.

Contestants	County	Pigs in Litter	when weighed Days old	As weighed	Corrected to 150 Days	Prizes State	Prizes County	Amount
John R. Iager & Son	Howard	11	150	2563.5	2563.5	1	1	$125.00
Ralph T. Wilson	Cecil	10	150	2327.5	2327.5	2	1	100.00
John R. Iager & Son	Howard	10	151	2304.5	2281.5	3	0	50.00
R. W. Farmer	Montgomery	12	150	2253.0	2253.0	0	1	25.00
H. Jones Baker	Howard	10	150	2150.0	2150.0	0	0	.....
H. E. Beard	Carroll	13	150	2030.0	2030.0	0	1	25.00
McDonogh School	Baltimore	12	150	2075.0	2075.0	0	1	25.00
C. Franklin Smith	Frederick	10	151	1887.0	1868.5	0	1	25.00
McDonogh School	Baltimore	10	148	1696.5	1731.0	0	0	.....
Benjamin Watkins	Anne Arundel	12	151	1538.0	1621.5	0	1	25.00
McDonogh School	Baltimore	10	151	1610.0	1594.0	0	0	.....
Stabler Bros.	Montgomery	10	150	1574.0	1574.0	0	0	.....
					Total			$400.00

Thereupon Mr. Freiert handed to each of the winners who were present a check for the prizes as indicated in the foregoing.

PRESIDENT WOLFE: We shall now have brief reports from some of the 1931 Litter Contest winners, and I am sure that all of us will be interested to hear how they succeeded in winning their prizes. First, we will hear from Mr. Maurice Iager, of my own county—Howard.

FIRST STATE PRIZE AND FIRST HOWARD COUNTY PRIZE LITTER, AND THIRD STATE PRIZE LITTER

By MAURICE IAGER, Howard County

Mr. Toastmaster and Gentlemen:

It gives me pleasure again to thank the Schluderberg-Kurdle Company for these prizes. They represent much of the profit made on these two litters, as farmers in 1931 lost money fattening hogs. I also appreciate the honor of holding the cup for Howard County for another year.

Our litter of 12 pigs (only 11 counted in the contest as one was hand-fed for a short time) was farrowed by a grade Duroc-Poland-China sow, and sired by a purebred O. I. C. boar. They had the run of a 7-acre field with plenty of grass, water, and shade.

Cost of 12 Pigs' Feed for 150 Days

500 lbs. w. and b. middlings	$ 7.50
400 lbs. red dog	5.40
600 lbs. 28% pig meal	14.00
50 lbs. fishmeal	1.70
100 lbs. dried buttermilk	5.00
4200 lbs. ground wheat	52.50
5850 lbs. concentrates	$86.10
450 gal. skim milk	22.50
Blue grass pasture, 3 months	6.00
	$114.60

Receipts

2755 pounds of pork sold @ 8¼c per pound	$227.29
First State prize	100.00
County prize	25.00
Total receipts	$352.29
Less feed cost	114.60
Balance	$237.69

Our second litter of 10 pigs that won 3rd prize was farrowed by a grade Poland China sow, sired by a pure-bred O. I. C. boar.

They Consumed Feed as Follows:

500 lbs. w. and b. middlings	$ 7.50
330 lbs. red dog	4.45
500 lbs. 28% pig meal	11.75
700 lbs. new corn	5.00
3000 lbs. wheat	30.00
5030 lbs. concentrates	$58.70
400 gal. skim milk	20.00
Blue grass pasture	6.00
	$74.70

Receipts

2230 pounds of live hogs sold @ 6¼c per pound	$139.37
Third State prize	50.00
Total receipts	$189.37
Less feed cost	74.70
Balance	$114.67

To secure these results the pigs must be healthy, fed a balanced ration, and kept clean.

REPORT OF STATE SECOND PRIZE, AN CECIL COUNTY FIRST PRIZE LITTER

By RALPH T. WILSON, Cecil County

Mr. Toastmaster and Gentlemen:

First, I want to extend my thanks and appreciation to the Wm. Schluderberg-T. J. Kurdle Company who have so

generously put up the cash during these years for this Contest. May their business increase!

Perhaps there are a few here who may recognize me as second prize winner of the last two years. I will be frank with you. I would much prefer to aim first, but somebody always beats me. I don't mean to brag, but they always have had to have more pigs to do it. I am thankful that Iager boy didn't have three litters entered, for he might have taken all three State prizes. At least, I want to congratulate him in making a new State record for a litter.

Telling about my 1931 litter is a little like trying to tell a story three times and trying to make it interesting each time. There were 10 pigs each time, from the same sow and the same boar: a grade Poland-China sow bred to a pure-bred Poland-China boar belonging to Ernest Cullen. This litter was farrowed April 13. Just 10 in litter, they all thrived and grew. I fed the sow a commercial pig feed with a little corn. As soon as the pigs would eat, I gave them the commercial pig feed, ground corn and wheat with a sprinkle of powdered milk in a trough by themselves. I increased the feed as fast they would take it. After a week or more I dissolved the skim milk powder in water and fed the whole as a slop. I weaned them at 8 or 9 weeks. I fed corn, 3 parts; wheat, 1 part; ground together—the commercial pig feed, skim milk powder, and some fish meal. At first, I fed more than half commercial pig feed, but gradually increased corn and wheat till the commercial pig feed was but a small part of the ration. While the skim milk lasted, I fed as a slop, but when that was gone, I gave the feeds dry in a trough and allowed the pigs to drink at the creek.

I kept these pigs in an old orchard—but eight trees left. The hog house is in one corner. There I kept the feed and fed them. A creek runs across the lower end and there they got their drinking water, and had their swimming hole. The grass is very much like lawn grass and last year the grass was unusually fine, as there was just enough rain to keep it green and growing.

Now as to their feed.

I charged both corn and wheat at 60c (the ration being 3 of corn to 1 of wheat); this with grinding, 15c per hundred, made the cost $1.17 per hundred.

4450 lbs. corn and wheat @ $1.17 per hundred		$ 52.06
1000 lbs. commercial pig feed @ $2.90		29.00
200 lbs. fishmeal @ $3.50		7.00
110 lbs. skim milk @ 4c		4.40
50 lbs. salt		.50
Grain cost		$92.96
Pasture		15.00
Trucking to Baltimore		10.00
		$117.96
2327 lbs. hogs @ 6½c	$151.25	
2nd State prize	75.00	
1st County prize	25.00	
		$251.25
Less feed cost		117.96
Balance		$133.29

I will say in closing this was the most satisfactory bunch of pigs I ever fed. Not one of them went off their feed. I have always said when hogs root, it is because something is lacking in their ration. You couldn't see a place where these pigs disturbed the turf.

I enjoy feeding hogs; also I love to watch them eat. Come to think of it, there is a verse in the Bible something like this. "The eye of the master fatteneth his cattle." The same holds with hogs. But in Biblical times neither the hog nor his feeder had much standing in the community. However, I hope that this is all changed now.

Just another word in closing, I still have Old Susie. We have won the 2nd State prize 3 years in succession, and total prizes amount to $275. I would be glad to hear from the other boys. Have they a brood sow that has beaten it?

REPORT OF ANNE ARUNDEL COUNTY FIRST PRIZE LITTER

By BENJ. WATKINS, 3RD

Mr. Toastmaster and Gentlemen:

Two litters per year are regularly raised from our grade (Duroc-Poland) brood sows. In 1928, I lost my herd with cholera, and continued with what I had left, using a pure-bred Duroc boar at all times.

This litter was farrowed May 11, 1931; there were 13 pigs farrowed; 6 sows and 6 boars lived. They were put on a clean pasture when three weeks old; this was a very poor hog pasture, mostly timothy grass, with some shade, but with no running water. A creep was soon built for the pigs. The pigs were weaned at 10 weeks.

Until the pigs were weaned the sow received skim milk (2½ gallons per day, which was all I had); a 28% commercial pig meal "cut" one-half with red dog flour; and ear corn. In the creep, the pigs were fed dried skim milk mixed with water and a dry feed of fishmeal, ground barley and corn. After weaning I continued the pigs on this ration. Semi-solid buttermilk was tried, but found to be unsatisfactory, as it would not keep. I did not use a self-feeder at any time, on account of poultry, but fed three times a day at first. Minerals were used regularly. A lot of green sugar corn fodder that had had most of the ears pulled was fed toward the last.

Cost of feeds. One object of this feeding was to utilize a lot of homegrown feed that was bringing a poor price on the market.

106 gal. skim milk @ 1½c gal	$ 1.59
100 lbs. red dog flour	1.60
150 lbs. 28% pig meal	4.10
400 lbs. fishmeal	15.20
300 lbs. dried skim milk	13.20
100 lbs. semi-solid butter milk	3.00
34 bu. wheat @ 40c	13.60
500 lbs. shelled corn @ 1½c	7.50
180 lbs. barley @ 1c	1.80
½ acre of sugar corn fodder	5.00
Pasture	5.00
Feed for sow during dry period	5.00
	$76.59

Cost per hundred pounds, $4.68—or a profit of 82c per hundred pounds, figuring that they brought 5½c, as the ½c premium went to pay Live Stock Show expenses.

The following resolutions were duly presented and were unanimously adopted at this session, and were also given the same favorable consideration at the Thursday morning session.

WHEREAS, through the interest and support of the Baltimore Union Stockyard Company, the Baltimore Association of Commerce, the Baltimore City Meat Packers, the State Board of Agriculture and the University of Maryland, the Baltimore and Ohio and the Pennsylvania Railroads, the livestock farmers of Maryland and other allied interests, the Baltimore Livestock Show was inaugurated in 1929 and has successfully held three livestock exhibitions that have won widespread recognition and credit for the State of Maryland, the City of Baltimore, and the stockmen of the State, and

WHEREAS, these livestock shows have been instrumental in stimulating increased interest in livestock production in the State of Maryland and the surrounding territory, resulting in improvement of the cattle, lambs, and hogs bred and fed within the territory tributary to the show, and

WHEREAS, interest in the livestock industry of Baltimore, the second largest in the list of city industrial enterprises, has been greatly increased and the said industry benefited thereby, and

WHEREAS, the improvement of the agricultural industry of the state of Maryland would be greatly promoted by the increased development of the livestock industry which automatically results from the holding of these stock shows; therefore, be it

Resolved, That the Maryland Stockmen's Association in annual convention assembled, does hereby express its approval of the satisfactory manner in which the Balti-

more Livestock Shows have been managed, and its appreciation of the benefits to the livestock interests of the State resulting from said shows; and be it further

Resolved, That we strongly urge the public authorities of the State of Maryland and of Baltimore City to contribute to the financial support of the Baltimore Livestock Show, in order that the continuance of the annual livestock exhibitions at the Union Stockyards shall be definitely assured.

Session adjourned.

THIRD SESSION

Lord Baltimore Hotel

Thursday, January 7, 1932

In the absence of Senator Wolfe, the Thursday morning session was presided over by Vice-President Jones.

CHAIRMAN JONES: Dr. Mark Welsh, inspector in charge of Hog Cholera, College Park, will now present a report covering the important work which he and his associates have done in undertaking to reduce losses from hog cholera in Maryland.

1931 HOG CHOLERA CONTROL REPORT

By DR. MARK WELSH, Inspector in Charge of Hog Cholera, College Park, Maryland

Mr. Chairman and Gentlemen:

Fewer outbreaks of hog cholera were reported in the first eight months of the year than in any similar period for the previous twelve years. Reports of serious outbreaks in the Middle Western States were current about the middle of July. About six weeks later, outbreaks in Maryland became more extensive. In fact, nine more outbreaks were reported for the 30 days of September than had been experienced in

the preceding 243 days. This history is typical of previous years when extensive outbreaks of cholera occurred in the Corn Belt States. In large measure this is due to infected pork which enters the channel of trade, the trimmings of which reach Maryland hogs through the feed.

For the year 1931, 538 outbreaks of hog cholera were reported in contrast to 219 in 1930—the lowest year on record—and a 12-year average of 526. It is interesting to note that 97, or approximately 18% of these outbreaks were in garbage feeding plants, and that 54.4% of all the hogs involved were in such places.

Of the 538 outbreaks reported during the year, 499 were primary, or new cases of the disease. Only 28, or approximately 5%, were secondary, or due to spread of the infection to nearby premises. Sick and dead hogs infecting the stream that watered hogs on adjoining farms caused 3 outbreaks. In 2 instances, men working with cholera infected hogs contaminated their clothes and spread the infection by direct contact to hogs on nearby premises. A truck used for transporting cholera infected hogs was later used, without cleansing or disinfecting, for hauling susceptible hogs, and these developed cholera, apparently from contamination left in the truck. In another instance, susceptible hogs were put in an uncleaned pen, where hogs had died of cholera a few weeks previous.

Four hundred seven outbreaks were classed as backyard; that is, a few hogs kept in a small pen or lot under restricted conditions. One hundred thirty-one occurred on farms where hogs were bred and raised. However, garbage feeding plants were maintained on 30 of these farms. There were, therefore, outbreaks of cholera reported on only 101 farms on which some care was used to maintain sanitary conditions. It is significant that for the past 9 years, outbreaks on such farms have averaged less than .7 of 1%. The average this year is approximately .5 of 1%.

General reports indicate that sufficient pork is reserved on most Maryland farms to supply the family needs through the colder months and well up into the spring and summer.

Merchants in rural regions report a considerable increase in the purchase of meats, especially pork, in the Fall months previous to the farm slaughter. The following table of outbreaks by months shows the sharp increase in the occurrence of cholera in Maryland in the Fall months:

January	16
February	13
March	7
April	4
May	4
June	5
July	14
August	14
September	87
October	200
November	134
December	40

The following table shows the principal causes of outbreaks of cholera in 1931, and their relation to the total:

Causes.	Number	Per cent total
Primary Causes:		
Table scraps	378	70.3
Garbage	97	18.0
New stock	24	4.5
Total, primary causes	499	92.8
Secondary Causes:		
Loose hogs	19	.....
Dead hogs in stream	3	.....
Virus on person	2	.....
Movement of hogs	2	.....
Infected truck	1	.....
Reinfected premises	1	.....
Total, secondary causes	28	5.2
Unknown causes	11	2.0
Total, all causes	538	100.0

As in past years, field data prove that the most important source of primary outbreaks of hog cholera in this State is infected pork scraps in the diet of the hog. The frequently mentioned spread of hog cholera by dogs, buzzards, trucks, streams, and other agencies, must of necessity originate from a primary outbreak. It seems evident that control and eradication of this disease must be founded on the principle of preventing introduction, harboring and spread of the infection. The factors chiefly responsible for primary outbreaks of cholera in Maryland are preventable by exercising care in the feeding and management of the swine herd. To a considerable degree, prevention of this disease on his premises, is within control of the individual swine grower.

Table Showing Outbreaks by Counties and Estimated Loss

County	Total		
	Out-Breaks	Hogs on place	Esti-mated deaths
Allegany	4	224	53
Anne Arundel	48	902	242
Baltimore	13	581	200
Calvert	12	102	78
Caroline	21	85	43
Carroll	9	217	90
Cecil	17	673	200
Charles	18	176	94
Dorchester	50	375	132
Frederick	24	287	101
Garrett	1	4	1
Harford	8	79	42
Howard	13	257	94
Kent	17	299	119
Montgomery	53	1,917	575
Prince Georges	54	1,393	557
Queen Anne	6	86	26
St. Mary's	9	221	36
Somerset	11	50	21
Talbot	8	117	66
Washington	74	1,565	523
Wicomico	13	132	45
Worcester	55	701	235
Total	538	10,443	3,573

Results compiled from case reports and questionnaires received show that of the 10,443 hogs involved in outbreaks, 84% were given serum treatment. Approximately 16% were too sick to vaccinate or were dead before the cases were reported and the premises visited. Of the clinically sick hogs that were vaccinated, 37% were saved. Of those that were apparently well at the time of vaccination, but had been exposed to the disease, approximately 92% were saved. If on the appearance of the disease the hogs had been promptly and properly vaccinated, the records indicate that the loss should not have exceeded 1,000 for the entire State.

It is believed that more than 90% of the outbreaks of hog cholera are reported each year. However, in the past it has been the custom to add 20% to the number of hogs involved in outbreaks to make an estimate of the total loss. Of the 10,443 hogs reported involved, 2,088 would represent 20% additional hogs presumed to have been exposed. The loss ratio of known cases was 34.2 deaths per 100 hogs exposed. This ratio applied to the above 2,088 hogs would represent an additional loss of 712 animals, or a liberally estimated total loss of 4,285 animals. Approximately 50% of these losses occurred in garbage feeding plants.

The following chart shows that 313 of a total of 538, or more than 58% of the hog cholera outbreaks, involved 9 hogs or less. The majority of these hogs were purchased or raised for future home consumption and were kept under backyard conditions in a pen or small lot. Usually feeding methods were poor, and frequently any wastes or supplementary feeds obtainable were used in an effort to reduce feeding costs. Stale bread, mill refuse, and kitchen wastes often were found to be extremely expensive either in first costs or subsequent losses. There is an apparent relationship between the herd size and the sanitary precautions taken. The small herds usually are kept under poorer sanitary conditions. When the herd size reaches 30 and over, better conditions usually prevail except in garbage feeding plants. Excluding the garbage fed herds, less than 5.6%

Table Showing Causative Agents by Outbreaks and Herd Groups for the Year 1931

Herd groups	No. outbreaks	No. hogs	Virus introduced by			Per cent of outbreaks caused by		
			Table Scraps	Garbage	Misc.	Table Scraps	Garbage	Misc.
5 and under	242	736	212	15	15	.....	.....	.....
6-9	71	531	57	6	8	85.6	6.7	7.7
10-14	64	750	43	12	9	.....	.....	.....
15-19	35	581	25	8	2	68.7	19.4	11.9
20-29	51	1,201	26	11	14	.....	.....	.....
30-39	13	436	6	5	2	43.8	25.0	31.2
40-49	16	685	3	4	9	.....	.....	.....
50 and over	46	5,523	6	36	4	13.0	78.3	8.7
Total	538	10,443	378	97	63	70.3	18.0	11.7

of the outbreaks occurred in herds of 30 and over. As in the past, the small feeder having little experience and using poor methods, lost most heavily.

The serum-virus or double treatment was administered to 168 herds on 114 premises. Garbage feeding plants were maintained on 77 of these and 37 were on farms where hogs were bred and raised. In 16 instances the hogs were sick when treated; 13 of these were in garbage feeding plants.

It was possible to investigate the results in 128 of the herds which were double treated. "Breaks" or losses as a result of administration of the treatment or subsequent to it occurred in approximately 19% of the herds investigated. In the 94 investigations made subsequent to treatment in garbage fed herds, approximately 23% had losses. This percentage rate is unusually high and indicates considerable virulent material in the garbage. Undoubtedly the treatment reduced losses that would otherwise have occurred from exposure to this potent source of cholera, but certainly it left much to be desired as a preventive agent under the conditions existing in such places.

In the following table the 23 Maryland counties are listed in relation to the percentage of rural population living on farms, together with the number and density of the swine population and data pertaining to hog cholera. In the group of 15 counties having an average of 50.5% of the rural population living on farms, a concentration of 59 hogs per 1,000 acres and a gross total of 102,502 in all, only 3.1% or 3,138 animals were exposed to cholera. Of these approximately 1,936 or 62% were saved. In the group of 8 counties having an average of 24.6% of the rural population living on farms, a concentration of 63.3 hogs per 1,000 acres and a gross total of 58,730 in all, 12.1%, or 7,305 animals were exposed to cholera. Of these, approximately 4,934 or 68% were saved.

Most of the counties in the latter group are adjacent to cities and have a large non-farm population. Two types of hog raising contribute to the high exposure rate in these localities: Garbage feeding plants, where many hogs are

Table Showing Human and Swine Population in Relation to Hog Cholera Data

County	(1) % rural pop. on farms	(1 & 2) Hogs per 1,000 acres	(1) Hogs in county	(3) Number of hogs exposed	(3) exposed % hogs to total hogs	(3) Outbreaks			
						No.	Garbage	Table scraps	Misc.
Charles	65.3	49.1	4,830	176	3.6	18	0	16	2
Calvert	61.7	33.1	1,930	102	5.3	12	0	10	2
Worcester	55.0	47.4	4,670	701	15.0	55	3	49	3
St. Mary's	54.7	78.8	5,960	221	3.7	9	1	8	0
Frederick	51.6	86.2	22,300	287	1.3	24	5	19	0
Garrett	51.2	50.3	4,347	4	0.09	1	0	1	0
Queen Anne	51.1	66.2	9,820	86	0.9	6	0	6	0
Caroline	50.7	43.2	4,670	85	1.8	21	2	19	0
Wicomico	49.4	45.8	4,025	132	3.3	13	2	10	1
Harford	49.2	37.0	4,670	79	1.7	8	0	4	4
Carroll	47.0	81.4	14,980	217	1.4	9	2	6	1
Howard	45.5	66.6	5,800	257	4.4	13	1	10	2
Talbot	45.5	44.3	4,670	117	2.5	8	0	7	1
Dorchester	43.1	31.2	3,220	375	11.6	50	0	50	0
Kent	42.7	55.8	6,610	299	4.5	17	3	12	2
Group Total	50.5	59.0	102,502	3,138	3.1	264	19	227	18
Washington	38.4	98.4	16,580	1,565	9.4	74	13	47	14
Somerset	38.3	40.3	2,470	50	2.0	11	0	11	0
Cecil	33.7	44.2	4,840	673	14.3	17	2	7	8
Prince Georges	31.1	51.7	6,660	1,393	20.9	54	25	23	6
Anne Arundel	26.6	37.0	3,220	902	27.2	48	7	33	8
Montgomery	25.8	81.3	13,680	1,917	14.0	53	21	24	8
Allegany	16.2	56.6	2,740	224	8.2	4	3	1	0
Baltimore	11.9	51.9	8,540	581	6.8	13	7	5	1
Group total	24.6	63.3	58,730	7,305	12.1	274	78	151	45
STATE	36.0	60.4	161,232	10,443	6.5	538	97	378	63

(1) Data derived from 1930 Census.

(2) Hogs per 1,000 acres are based on plowable crop and pasture land. This basis was considered more nearly correct than total land in farms, including woods and waste land.

(3) Data compiled from records of work in 1931.

kept on a small acreage and numerous premises where a few hogs are kept under backyard conditions. In both types the possibility of good sanitary surroundings is less, and the probability of infection is greater than in farm herds. There are, of course, exceptions, but data indicate that these two are the most prolific in starting primary centers of hog cholera.

In the entire group of 23 counties there is an average of 36.0% of the rural population living on farms, a concentration of 60.4% hogs per 1,000 acres, and a total of 161,232 hogs. Approximately 10,443 or 6.5% of the total hogs were exposed to cholera. Of these, about 3,573 died of cholera, which was approximately 2.2% of the hogs in the State. However, 1,324, or 0.8% were dead before the cases were reported.

Much of this loss could have been prevented had the individual swine grower exercised care in feeding and managing his herd and promptly reported sickness when it occurred. At that, the loss of 2.2% is well below the average for the country as a whole.

Activities of the hog cholera force for the year may be summarized as follows:

Meetings attended		103
Interviews:		
Farmers	5,080	
Veterinarians	407	
Others	1,891	7,378
Farms visited		2,907
Autopsies		154
Diagnoses made:		
Hog cholera	538	
Digestive trouble	123	
Deficiency disease	40	
Gastro-enteritis	21	
Food and salt poisoning	21	
Injury	20	
Constipation	17	
Pneumonia	15	
Parasites	6	
Malnutrition	4	
Necrotic enteritis	2	
Peritonitis	2	
Mammitis	1	

correct than total land in farms, including woods and waste land.
(3) Data compiled from records of work in 1931.

Metritis	1
Infectious bronchitis	1
Dermatitis	1
Arthritis	1
Abscess	1
Tetanus	1
Toxemia	1

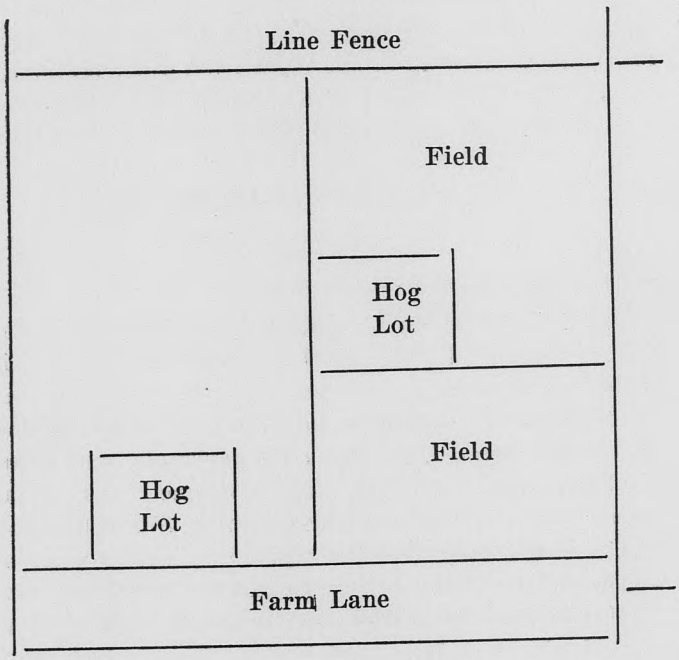
Hog Cholera Control In Maryland

Hog cholera is caused by a minute organism or virus that apparently is infectious for hogs and hogs only. Maryland data indicate that when a primary outbreak occurs in hogs, it is usually the result of this causative agent infecting susceptible hogs as:

1. Virus from tissues of a market hog as bones, rinds and scraps of pork, fed with garbage, offal and kitchen wastes.
2. Virus from live hogs, as by introducing infected new stock to the herd.
3. Virus from the bottle when improperly used in serum-virus vaccination methods to produce immunity against the disease.

Secondary outbreaks, or spread of the infection from primary centers, are rare when the owner and neighbors are aware of its existence in the vicinity. Last year only 5.2% of the outbreaks were attributable to spread of the infection to nearby premises.

On typical farms the line fences are used to enclose farm stock and to exclude others. Hogs confined to a pasture, lot or pen on the premises, away from a line fence, have double protection and are virtually isolated. When cholera occurs in such a herd, it was carelessly or unwittingly introduced in the vast majority of cases either in the feed or by new stock. If the virus gets off the premises and infects other hogs in the neighborhood, it usually must have either the help or consent of man. Man, either directly or indirectly, is the chief spreader of hog cholera. Exceptions occur, but their number is not significant in comparison with the total. Sanitation is the chief hope of eradication, and serum reduces losses when errors of sanitation occur.



Hogs isolated as in above diagram away from line fences are comparatively free from danger of hog cholera except as introduced by feeding infected bones, rinds and scraps of pork and by new stock.

It would be desirable to keep hogs that may have virus in their tissues out of the channels of trade. Until this is accomplished it seems unnecessarily hazardous to feed any trimmings or wastes that may carry infection. Neither is it wise to buy hogs of unknown origin and make herd additions until their freedom from disease is a certainty rather than a hope.

When the efforts of both the regulatory authorities and swine producers are united in preventing the start of primary outbreaks and the maintenance of centers of infection of hog cholera, the spread of this disease will be curtailed, and it will cease to be the chief death stalker of the hog lot.

CHAIRMAN JONES: The Baltimore Live Stock Show is an

annual event which has been of much interest to Maryland Stockmen as well as to stockmen from other sections. Mr. W. R. Harvey, manager of the Show, and formerly president of this Association, will give a report of the 1931 show.

1931 BALTIMORE LIVESTOCK SHOW

W. R. HARVEY, Manager

Mr. Chairman and Gentlemen:

The 1931 Baltimore Live Stock Show, held on October 12, 13, 14, 15 and 16, at the Union Stockyards, Baltimore, opened on Monday at 1 o'clock, with the Collegiate Judging Contest; in this contest there were four teams, of five students each, entered, one from Pennsylvania, one from Connecticut, one from Maryland and one from Delaware. Awards were as follows: First prize of $75 cash and silver trophy was awarded to Pennsylvania; second prize of $50 was awarded to Connecticut; third prize of $25 was awarded to Maryland. These students worked on classes of horses, individual steers, hogs, and lambs. The contest proved to be very interesting to visitors at the show, and there was a good crowd at the ringside during the entire contest.

On Tuesday morning at 9 o'clock the judging of the carlots of fat cattle began, in Department A, Class 2, 15 head of steers or heifers weighing under 1100 pounds, open to the world. The prizes were awarded as follows:

1. Dan. D. Casement, Manhattan, Kansas, on 15 Herefords.
2. Sni A. Bar. Farms, Grain Valley, Mo., on 15 Shorthorns.
3. To Briarcliff Farms, Pine Plains, N. Y., on 15 Angus.
4. John K. Martin & Son, Troy, Ohio, on 15 Angus.

In Department B, Class 1, for 15 steers or heifers weighing over 1100 pounds, for cattle from the seven Southeastern States, the prizes were awarded as follows:

1. G. W. Miley, Moorefield, West Va.
2. Campbell & Cassell, Wytheville, Va.
3. S. A. Smith, Clarksburg, W. Va.
4. R. W. Miller, Hawlin, Va.

In Class 2, Department B, for 15 steers or heifers weigh-

ing under 1100 pounds, for cattle from the Southeastern District, prizes were awarded as follows:

1. St. Amour Company, Mortonville, Pa.
2. St. Amour Company, Mortonville, Pa.
3. F. H. T. Walton, Forest, Va.
4. P. B. Bird, County Agent, Marion, Va.

Champion carload of fat cattle in the open classes, was awarded to D. D. Casement on his load of Herefords.

Champion carload of fat cattle in the Southeastern District went to St. Amour Company on their Herefords, which were later made the grand champion load of the show, with the reserve championship going to the Casement Herefords.

On Wednesday morning at 9 o'clock the work of judging the trios, individual steers, open classes and the Boys' Club steers began.

The trio prizes awards were as follows:

1. Briarcliff Farms, Pine Plains, N. Y. on three Angus.
2. St. Amour Company, Mortonville, Pa., on three Herefords.
3. Green Bros., Markham, Va., on three Angus.
4. E. L. Preston, Warrenton, Va., on three Angus.

In class for individual steers or heifers open to all, prizes were awarded as follows:

1. Briarcliff Farms, Pine Plains, N. Y., on an Angus.
2. Briarcliff Farms, on an Angus.
3. St. Amour Farms, Mortonville, Pa., on a Hereford.
4. To Briarcliff Farms, on an Angus.

In Department E, Boys' Club steers or heifers, awards were as follows:

Herefords

1. P. B. Bird, County Agent, Marion, Va.
2. P. B. Bird, County Agent.
3. J. C. Coiner, County Agent, Staunton, Va.
4. Morgan Rodgers, Bridgeport, W. Va.
5. Jack Butler, Warrenton, Va.

Shorthorns

1. D. Skaggs, Lewisburg, W. Va.
2. J. C. Coiner, County Agent, Staunton, Va.

3. P. B. Bird, County Agent, Marion, Va.
4. J. C. Coiner, Agent.
5. J. H. Parker, Junction, W. Va.

Angus

1. P. B. Bird, County Agent, Marion, Va.
2. Greb Bros., Markham, Va.
3. B. A. Rucker, Jr., Warrenton, Va.
4. Green Bros., Markham, Va.
5. P. B. Bird, County Agent.

Feeder Cattle

In Department F, carload of 20 head of calves weighing under 550 pounds, prizes were awarded as follows:

1. Benj. F. Creech, Agent, Morgantown, W. Va., on a load of Herefords.
2. Arthur Monk, Philadelphia, Pa.
3. Frank Anderson & Son, Omaha, Neb.
4. E. C. Wunder, Baltimore, Md.

For carload of feeder cattle weighing over 550 pounds and not over 850 pounds.

1. Mid-West Live Stock Co., Sioux, City, Iowa.
2. Mid-West Live Stock Co., Sioux City, Iowa.

The Grand Champion carload of feeders was the load of Hereford calves exhibited by Benj. F. Creech, agent, from West Virginia.

Prizes in the Swine Department were also awarded on Wednesday morning, first prize in the carload classes going to Sni A Bar Farms, Grain Valley, Mo.

In class for pen of five fat hogs weighing 150 to 180 pounds.

1. Sni A Bar Farms.
2. Ira C. Daub, Hagerstown, Md.
3. William J. Hines, Jr., Brighton, Md.

In class for pen of five fat hogs weighing 180 and not over 225 pounds.

I. Sni A Bar.
2. E. Talbott, Clarksville, Md.
3. Guy R. Nelson, Jr., Monkton, Md.

Individual barrows weighing 150 to 225 pounds.

1. Sni A Bar, Grain Valley, Mo.
2. Ira C. Daub, Hagerstown, Md.
3. William J. Hines, Brighton, Md.

Grand champion carload of fat hogs, Sni A Bar Farms, Grain Valley, Mo., who also won grand championship on their pen of five fat hogs and their individual barrow.

FAT LAMBS

The prizes were also awarded in the Fat Lamb Department on Wednesday morning with the following results:

In Class for 50 head of fat lambs:
1. G. C. Dixon, Bayard, W. Va.
2. W. M. Shifflet, Waynesboro, W. Va.
3. Ritchie Company Live Stock, Harrisville, W. Va.
4. G. C. Dixon, Bayard, W. Va.

Pen of fifteen fat lambs:
1. Ritchie Company Live Stock, Harrisville, W. Va.
2. Greenbrier County 4-H Club, Lewisburg, W. Va.
3. Ritchie Company Live Stock, Harrisville, W. Va.

Pen of three fat lambs:
1. Ritchie Company, Live Stock, Harrisville, W. Va.
2. Ritchie Company Live Stock, Harrisville, W. Va.
3. University of Maryland, College Park, Md.

Individual fat lamb:
1. Ritchie Company Live Stock, Harrisville, W. Va.
2. Ritchie Company Live Stock, Harrisville, W. Va.
3. University of Maryland, College Park, Md.

Grand champion carload of lambs, G. C. Dixon, Bayard, W. Va.
Grand champion pen of 15 lambs, Ritchie Company Live Stock, Harrisville, W. Va.
Grand Champion pen of three lambs, Ritchie Company Live Stock, Harrisville, W. Va.
Grand champion individual lamb, Ritchie Company Live Stock, Harrisville, W. Va.

Banquet

On Wednesday night at 6 o'clock, at the Southern Hotel, the annual banquet was held with an attendance of nearly 400 men. Mr. J. H. Baugher, chairman of the show committee and president of the Stock Yards Company was toastmaster.

Other speakers of the evening were, Hon. Howard W. Jackson, Mayor of Baltimore; Joseph P. Healy, president of the Baltimore Beef Packers Association; Dr. R. A. Pear-

son, president of the University of Maryland; Dr. F. B. Bomberger, of the Federal Farm Board; Professor W. H. Pew, manager of Briarcliff Farms, Pine Plains, N. Y.; William Schluderberg of C., of Schluderberg-Kurdle Company; and Tim H. Ingwersen of Chicago, who judged the carloads of cattle in the open classes.

The Sale

On Thursday morning promptly at 9 o'clock the sale of all the fat cattle was opened with a large attendance, and buyers were there from all of the principal eastern markets; the results were very gratifying to all concerned.

The first carload of cattle was offered at 9.25, and in a little over seven hours we sold over 2,400 head of cattle, or, to be more exact, we sold over five cattle per minute for seven hours straight, without a stop, for a total of $188,-128.41.

The grand champion load of fat cattle at $25 per cwt. was $4.50 per cwt. higher than any other carload of cattle sold for in the United States during 1931. The general averages and totals for all classes are as follows, with the total sum received for all stock sold, amounting to $212,594.20.

Totals of sale of all classes of live stock sold at the 1931 show and sale

Fat Cattle

Carload lots of fat cattle, departments A and B	$171,214.81
Trios of steers	2,280.59
Individual steers, open classes	5,205.24
Boys' Club steers	9,427.77
Total	$188,128.41

Feeder Cattle

All classes of feeders	$ 20,313.46
Total for all classes of cattle	$208,441.87
All classes of hogs	$ 1,411.39
All classes of lambs	2,710.94
Total amount received for all stock sold	$212,594.20

Distributed as Follows

Department A. Champion carload of fat cattle exhibited by Dan D. Casement	$11.75 per cwt
Department B. Champion carload of fat cattle exhibited by St. Amour Farms	25.00 " "
Grand champion carload of fat cattle exhibited by St. Amour Farms	25.00 " "
Reserve campion carload of fat cattle exhibited by Dan D. Casement	11.75 " "
Grand champion trio of steers exhibited by Briarcliff Farms	15.91 " "
Reserve champion trio of steers exhibited by St. Amour Farms	14.73 " "
Grand champion individual steer exhibited by Briar cliff Farms	36.00 " "
Reserve champion individual steer exhibited by P. B. Bird, County Agent	61.00 " "
Grand champion Boys' Club steer exhibited by P. B. Birds, County Agent	61.00 " "
Grand champion carload of feeder cattle exhibited by the West Virginia Live Stock Association, Benj. F. Creech, Agent	11.20 " "

Fat Cattle, carload lots

Av. price of highest selling five carloads	$13.70 per cwt
Av. price of highest selling ten carloads	12.60 " "
Av. price of highest selling twenty carloads	11.80 " "
Av. price of highest selling thirty carloads	10.70 " "
Av. price of highest selling forty carloads	9.12 " "

Feeders

Av. price of highest selling five carloads	$6.46 per-cwt
Av. price of highest selling ten carloads	5.94 " "

Individual Steers, Open Class

Av. price of five highest selling individuals	$24.20 per cwt
Av. price of ten highest selling individuals	21.20 " "
Av. price of twenty highest selling individuals	17.50 " "
Av. price of thirty highest selling individuals	15.00 " "

Boys' Club Steers

Av. price of highest selling five Steers	$28.20 per cwt
Av. price of highest selling ten steers	23.78 " "
Av. price of highest selling twenty steers	18.97 " "
Av. price of highest selling thirty steers	16.53 " "
Av. price of highest selling thirty-five steers	15.87 " "

Hogs

Grand champion carload of fat hogs, exhibited by Sni A Bar Farms	$7.10 per cwt
Grand champion pen of five fat hogs, exhibited by Sni A Bar Farms	6.90 " "

Reserve champion pen of five fat hogs, exhibited by Sni A Bar Farms	7.00 per cwt
Grand champion barrow exhibited by Sni A Bar Farm	15.00 " "
Reserve champion barrow exhibited by Ira C. Daub	6.75 " "

Fat Lambs

Grand champion carload of lambs, exhibited by G. C. Dixon	$11.25 per cwt
Grand champion pen of fifteen lambs exhibited by Ritchie Company	11.50 " "
Grand champion pen of three lambs exhibited by Ritchie Company	9.00 " "
Grand champion individual fat lamb exhibited by Ritchie company	25.00 " "

In addition to the young cattle sold for grazing and feeding purposes there were a number of young cows and heifers sold to farmers from different parts of the State for establishing breeding herds with the idea of producing their own steers. Each lot of the young cows was headed by a pure bred bull so that in a short while we can expect most satisfactory results from the venture.

The prices obtained at all three of the sales, 1929, 1930 and 1931, have been, on an average, very satisfactory to the sellers.

The price of the grand champion carload of fat cattle at the 1929 show exhibited by Dan D. Casement and purchased by the Schluderberg-Kurdle Co. at $50 per cwt. has been equaled in the world but once.

The prices obtained for the individual and Boys' Club steers have been especially satisfactory and should be encouraging to members of the different clubs in Maryland and adjoining States. Great care should be exercised in selecting nothing but good qualitied steers to feed and those that will not weigh over 900 to 1,000 pounds, in prime condition at show time.

We feel that the Baltimore Live Stock Show has now passed the experimental stage; the classes in all departments have always been filled with stock of good quality; the sales have been a success, with a grand total for the three sales of $777,727.49, which could not have been accomplished without the united support of the buyers in Balti-

more and from all of the eastern markets. And for the support and co-operation of those interested in the different branches of the live stock industry; and to my friends in the experimental and extension work over at the University of Maryland, for the splendid assistance that they always willingly rendered, I am most grateful.

CHAIRMAN JONES: Maryland purchasers of commercial feeds should be well posted concerning the feeds which they buy and use. The Maryland Feed Inspection Service is doing important work in the enforcement of Maryland's feed-stuff laws, and we are fortunate in having an opportunity to hear from Mr. L. E. Bopst, Associate State Chemist, today. Mr. Bopst will give us some information concerning the feed inspection work at College Park.

MARYLAND STATE FEED INSPECTION SERVICE

L. E. BOPST, Associate State Chemist, College Park

Mr. Chairman and Gentlemen:

When I was asked to appear before you this morning, I welcomed the opportunity. It is always a pleasure to discuss one's work in public, and doubly so before an audience which may be expected to take not only an intelligent, but also a sympathetic, interest in that work. I hope that I may not be suspected of being either a politician or a Rotarian if I borrow a much abused term and say that it is the aim of our depart ment to render service—service primarily to the agricultural interests, yet at the same time removing unjust competition from the feed industry.

Your chairman has given me permission to ramble at will over the general subject of feed control work in this State. You are all familiar with the essential provisions of the Maryland Feed law. I shall not bore you with an extended resumé. Briefly, the act lays upon our organization the responsibility for the registration and sampling of feeds sold; for the chemical and microscopical examina-

tion of samples collected; for the publication of results obtained, and for the prosecution of violations of the law.

The work of inspection includes the examination of packaged goods to see that the labeling complies with the law and that the notation of guarantees and declaration of ingredients compare with the information filed at the time of registration. We have three inspectors who are canvassing the State at all times, securing samples from goods that have entered intra-state commerce, most of the goods being found in the possession of dealers, in freight stations, steamboat wharfs, etc. Sampling, by the way, is one of the most important operations of control work. Unless a representative sample is obtained, the analytical report is meaningless. Samples are taken with an instrument known as a tryer, which draws from the feed sack a core in which all levels from top to bottom are equally represented. A large proportion of the containers in any lot are sampled—nothing less than twenty if the lot consists of as many as twenty sacks. The cores are thoroughly mixed and placed in a 12-ounce glass bottle. After the sample has been thus obtained, it is marked for identification and delivered to our offices together with a slip bearing the relevant information secured from the package. Proper entries are made in our records, and the sample is next turned over to the laboratories for examination.

The analytical work which is performed is divided into two main classes—chemical and microscopical. The former is quantitative and is used as a means of substantiating the protein, fat, and fibre guarantees. The latter is qualitative and concerns itself with an identification of the ingredients present. As many of you no doubt know, it is entirely possible to concoct a high-protein feed made from feathers, hair, and sawdust, yet from the standpoint of the feeder this is a very poor product. Microscopical examination will eliminate such practices. It is very difficult, perhaps I should say impossible, to determine accurately the actual quantities of ingredients in any feed. It is quite possible, however, for an experienced technician to say

with assurance whether or not a given material is present in appreciable quantities, or to identify all of the ingredients of a given mixture.

All results obtained in our laboratories are entered upon our records and four times each year are assembled and published in bulletin form. Probably all of you receive our bulletins regularly. In case any of you do not, we shall be glad to add your names to our mailing list.

Flagrant violations of the law are of course prosecuted—either under Maryland law or in co-operation with Federal authorities under the National Food and Drug Act. Under the State law our authority extends no farther than the State boundaries. Each dealer is legally responsible for the goods he handles, regardless of who the manufacturer may be. Where it is evident that a dealer has purchased products in good faith from an out-of-State manufacturer, which later turn out to be deficient, the responsibility is placed upon the manufacturer where it justly belongs, and this is accomplished by turning the prosecution over to Federal authorities under the provisions of inter-state commerce regulations.

Possibly you would be interested to know of some specific violations that we have noted. Aside from the ordinary protein deficiencies and the substitution of a low grade material for a high grade one, we have actually found meat scrap sold in Maryland containing as much as 10 per cent added sand; we have found fishmeal adulterated with ground dried apples, other lots have been debased by the addition of bone meal and ground crab scrap, as well as sand; peanut meal containing an appreciable quantity of rubbernut meal; tankage adulterated with vegetable material, showing improper method of manufacture; we have found molasses horse feed colored green with a coal tar dye. Needless to relate, these companies were all prosecuted and the materials removed from the market.

Nevertheless, I am glad to say that the law is for the most part well observed in Maryland. During the year 1924, when intensive operations were first undertaken, 33

hearings on violation were initiated. This number has steadily diminished, although activities of the Department have increased both in extent and in efficiency until it was found necessary on only four occasions during 1930, and only two in 1931 to initiate legal action against certain producers. Most manufacturers and dealers earnestly desire to comply with all reasonable regulations, not only on ethical grounds but also because it is a part of good business. Recognizing this, the Inspection Service has chosen to regard this law as corrective rather than punitive. Considering the volume of manufactured products coming within the jurisdiction of this law, the proportion found adulterated is very small. It is necessary, however, for control officials to be constantly on the alert to restrain that small portion of the industry who will take the chance of producing a dishonest product.

Chairman Jones asked Mr. Harvey to take the chair; and Mr. Jones presented the following statement concerning plans that are under way for the establishment of selling agencies at Eastern Livestock Markets.

EASTERN LIVESTOCK MARKETING PLANS

J. W. JONES, Vice-President, Eastern Livestock Co-operative Marketing Association, Olney.

Mr. Chairman and Gentlemen:

For a number of years Maryland feeders have been giving more or less serious attention to the matter of establishing at the Baltimore Union Stock Yards and at other eastern livestock markets co-operative selling agencies through which to dispose of their market cattle, sheep and hogs. Until rather recently, there has been no important, definite plan that could be considered suitable for meeting the needs of our Maryland and other near-by producers of meat animals. However, I am glad to be able to report at this time that we are ready with a plan which we believe deserves favorable consideration by Maryland stockmen. In short, we expect soon to

see a co-operative selling agency in active operation at the Baltimore Union Stock Yards, and I earnestly urge stockmen of Maryland to give to this movement their active moral and financial support.

Time does not permit a full presentation of all details of the plan for this movement, but I shall attempt to present briefly some of the most important features of the plan.

The Eastern Livestock Co-operative Marketing Association, Inc., is a regional marketing agency set up for the purpose of serving livestock producers in Virginia, West Virginia, Maryland, Tennessee, North Carolina, New York, New Jersey and Pennsylvania.

It is governed by a board of nine directors. The present board consists of one livestock producer from each of the eight States mentioned, with the exception of Maryland, which has two directors to comply with the Maryland law. In addition to the board of directors, the plan provides for an advisory board or council from each State. This board consists of not less than seven members whose duties are to secure membership, build up volume and direct field service within their State.

At the suggestion of the temporary committee representing the producers, the directors of extension from each of the eight States mentioned made recommendations for the appointment of the first board of directors who will serve until their first annual meeting at which time the producer members will elect their own directors. The present list of directors is as follows:

Virginia—Thomas B. Glascock, Upperville, president.
Maryland—J. W. Jones, Olney, secretary-treasurer; R. W. Farmer, Derwood.
Tennessee—Roy F. Bell, Blountville.
Pennsylvania—B. H. Wilson, Coatesville.
West Virginia—Ross H. Tuckwiller, Lewisburg.
North Carolina—W. W. Jarvis, Moyock.
New York—H. E. Babcock, Ithaca.
New Jersey—No director has yet been selected.

Livestock producers from the States of Maryland, Pennsylvania, North Carolina, Tennessee, Virginia and West Virginia met with representatives of the Federal Farm Board and of various State agricultural colleges in November, 1930, and appointed a committee to work out plans for such an organization. Livestock producers, representatives of dairy associations, farm organizations, extension and agricultural college workers, together with representatives of the Farm Board, attended the various meetings during the past year, and definite plans were perfected for the establishment of the Eastern Livestock Co-operative Marketing Association.

This movement was started because eastern livestock producers feel the need of a more efficient marketing service and feel that now is an opportune time to establish such an agency as a part of the National Livestock Marketing Association.

It will maintain efficient sales agencies at the terminal markets of Baltimore, Jersey City, Lancaster, Pa., and other points as needed.

As a member of the National Livestock Marketing Association it will be able to offer its members a financing and buying service for the purchase of feeder cattle or sheep for feeding or pasturing purposes, through the National Feeder and Finance Corporation, a subsidiary of the National Livestock Marketing Association. It will offer a research and market information service. It will maintain a claim and transportation service.

This agency will start operations just as soon as enough producers are sufficiently interested and have signed that marketing agreement so that the board of directors will feel reasonably sure that a minimum of 2,000 carloads of livestock will go through these terminal agencies the first year of operation, thus assuring sufficient volume, and as soon as at least $25,000 worth of capital stock is subscribed by producers.

The Association has an authorized capital stock of $50,000 consisting of 25,000 shares of common stock with

par value of $1.00 per share and 1,000 shares of preferred stock with par value of $25.00 per share. Common stock of the Association may be purchased only by bona fide producers of livestock who have signed the agreement to market their livestock through the Association. The holders of common stock are entitled to one vote regardless of the number of shares owned. Preferred stock has no voting privilege and its dividends are non-cumulative and limited to 8 per cent. After preferred dividends are paid and sufficient reserves are set up net earnings will be refunded to the producer members on a patronage dividend basis annually.

The terminal market charges will be the same as the standard rate of charges on each market. However, all the earnings above the actual cost of handling, less dividends on the preferred stock and deduction of reserves will be prorated annually back to the producer members upon the basis of volume consigned to the Association.

This system will offer both the small and large producer an opportunity to have his livestock sold on its merits and any savings which may be made will belong to the producer.

The producer may make use of this Association through his local livestock shipping association, if one is operating in his territory, or he may assist in the organizing of such local association, or he may ship or truck his own livestock direct to the terminal agency which offers the best market for his particular class or grade of livestock.

The National Livestock Marketing Association is a federation of 22 co-operative sales agencies representing approximately 350,000 members. It operates on most of the principal livestock markets of the United States. This Association serves livestock producers from Buffalo and Pittsburgh on the east, San Francisco on the west and St. Paul on the north to Ft. Worth on the south. For the year 1930 the member agencies of this National Association handled over 8,000,000 head of livestock valued at over 164 million dollars. It is the largest organization of its kind in the world today.

Numerous member agencies of the National are now handling from 20 to as high as 40 per cent of the entire receipts on the markets on which they operate. With this large volume they have been able to increase their bargaining power and improve market services to producers. Since 1922 when the first of these agencies was established over $3,000,000 in savings and refunds have been made. Substantial reserves have been set up. Improved facilities at stockyards have been provided. Hundreds of thousands of dollars in claims have been collected and a general improvement in stockyard practices have been brought about through the efforts of the co-operatives. As a specific example let us take the Producers Commission Association of Cincinnati, Ohio. This Association, established less than six years ago, with $36,000 in capital has set up a reserve of over $100,000 in addition to returning over $140,000 in cash refunds to its members. In addition to numerous improvements in yard services and practices this agency leads all of the 20 firms operating on the Cincinnati market in volume of business. During 1930 it handled nearly 30 per cent of all the business coming to that market.

The success of this organization depends entirely upon the support given it by livestock producers in this territory. Judging from the success of similar organizations in other sections of the country there is no reason why the Eastern Livestock Co-operative Marketing Association should not succeed, but its success will depend entirely upon the upport given it by the livestock producers in this area.

CHAIRMAN JONES: Dr. E. B. Simonds in charge of tuberculosis eradication work in Maryland, is here today. We shall be pleased to have a brief report of the work in this important branch of animal disease control.

TUBERCULOSIS ERADICATION ACTIVITIES IN MARYLAND

DR. E. B. SIMONDS, Inspector in Charge, Tuberculosis Eradication, U. S. Department Agriculture,
824 Fidelity Bldg., Baltimore

Mr. Chairman and Gentlemen:

On January 1, 1932, there were 39,923 herds, with 260,941 cattle under State and Federal supervision for the eradication of tuberculosis. Of this number 11,873 herds, with 140,005 cattle, are fully accredited. There are five accredited counties and fifteen counties in which all the cattle have been tested for tuberculosis one or more times.

This work has enabled the farmer to meet his milk market requirements, and to have safe milk for home consumption, and it also gives him a market for any surplus cattle he may raise. The States to the north and east of us now come to Maryland to buy their herd replacements; our records show that we shipped out three thousand head of dairy cattle in the past year.

CHAIRMAN JONES: Dr. Chrisman also is in the audience. We shall be glad if he will tell us briefly of his field work in controlling disease of livestock in Maryland.

LIVESTOCK SANITATION

DR. WM. GEO. CHRISMAN, Chief Field State Veterinarian.
816 Fidelity Building, Baltimore.

Mr. Chairman and Gentlemen:

The field work has naturally grouped itself about the several classes of animals, viz: horses, cattle, sheep, hogs, dogs and poultry.

In horses, forage poisoning or botulism, and parasites, both external and internal, have attracted our greatest attention. Good farm practices and sanitation are important; the important thing, is prevention rather than cure.

Cattle diseases that claim much attention are tuberculosis, Johnes' disease (or para-tuberculosis), Bang disease (or abortion disease), and mammitis (garget or mastititis). The tuberculosis eradication program is so familiar that it needs no further discussion. The plan for control of Bang disease is similar to the original accredited herd plan for tuberculosis; this is progressing satisfactorily.

Mastitis appears in many herds and causes great damage in suppressed milk and sometimes results in a loss of one or more quarters of the udder and the elimination of the animals from the herd. The transmissibility of the disease gives cause for an active program of control that includes:

(a) Temporary or permanent removal of affected cow from the herd.
(b) Thorough cleaning of barn followed by proper disinfection.
(c) Efficient professional service with careful execution of instructions.

Johnes disease or para-tuberculosis is a disease of the digestive system, and is handled much as is the Bang disease.

The diseases of sheep in Maryland have not filled a large list, but the few have collected heavy tolls. Scabies which was so prevalent on the Eastern Shore and was found in a few Western Shore counties, called for an active and drastic program of dipping and cleaning and disinfecting pens and barns; the disease has been eradicated. Stomach worms and nodular disease cause great losses annually,—nodular disease in mature sheep and stomach worms in lambs. The treatment is so simple and effective, that there appears to be no reason, save neglect, why the losses should not be reduced to a minimum. Frequent change of pasture; cleaning and disinfecting of pens and stables; and the use of copper sulphate and nicotine sulphate will prevent 95 per cent of the losses.

Hog diseases can almost be covered in two words: cholera

and parasites. The treatment can be described about as briefly: sanitation. Perhaps no class of animals receives as little attention and occupies worse living quarters. The age-old expression "anything is good enough for a hog" has become so rooted and grounded in our minds that its practice is costing Maryland hogment thousands of dollars annually. If we could bring ourselves to the point of eliminating the old pig pen, designed and likely built by our grandfathers, and would then house our hogs in new houses on fresh land, a large portion of our losses would turn to profit. Burying or burning carcasses of all hogs that die of disease on the premises will greatly reduce losses.

Dogs are disseminators of many serious diseases. In fact, I doubt if we give him credit, if credit it be, for all the diseases he transmits or transports from farm to farm, far and near. Certain it is rabies is almost solely transmitted by his bite. For this disease there is no cure. Preventive measures, only, can be employed. Whenever a person or animal is bitten by a dog, especially a strange or stray dog, the offending dog should by all means be secured and kept confined until examined for rabies by a competent veterinarian. In case of doubt or inability to secure the dog, the person bitten should consult his physician without delay.

Poultry now plays such an important role in the economic farm program that it should receive all possible disease protection. Pullorum disease, prevention and control, has a well defined program. The parasitic infection likewise, but tuberculosis needs careful consideration. The usual program of economical, profitable poultry raising where the cock birds find a market early has had its influence. If we follow the plan of letting the hens of tuberculosis-infected flocks follow this routine after one, or, at the most, two, laying seasons she will carry away the source of the disease and in a few seasons with constant cleaning and disinfecting, complete eradication of this dreaded disease should result.

This whole matter can be summed up in two words as full of meaning as a pomegranate is full of seeds: "farm

sanitation," which is illustrated by this instance which took place in North Carolina some years ago:

A section boss on the Southern Railroad between Raleigh and Goldsboro, who had a few miles of road bed to work in one of the swampy districts, spent most of his time ditching. Upon one occasion the division superintendent, becoming exasperated at the apparent lack of progress in certain repairs, called the section boss to account by asking: "What is the most important thing in keeping a road-bed in shape?"

The answer was, "Ditching."

The superintendent asked, "What is the second most important thing?"

The answer was, "Ditching."

The superintendent asked, "What is the third most important thing?"

The answer was, "Ditching."

Like the section boss, I say the most important thing in disease control is "farm sanitation."

CHAIRMAN JONES: Mr. B. E. Carmichael of the University of Maryland Agricultural Experiment Station, will discuss some of the results of recent experimental work done at that institution with rations for hogs.

SOME RECENT MARYLAND EXPERIMENTS WITH HOGS

B. E. CARMICHAEL, Animal Husbandman, University of Maryland Agricultural Experiment Station, College Park.

Mr. Chairman and Gentlemen:

A number of experiments with rations for young fattening hogs have been conducted recently at the University of Maryland Agricultural Experiment Station, and some points in connection with two of these experiments will be considered briefly as it is believed that they are of timely interest. Before long it is hoped to have these experiments, as well as a number of others, reported in bulletin form,

but the data are not now available in the form of a Station bulletin.

On account of the abundance and cheapness of wheat, a large amount of wheat has been fed to farm animals in 1930 and 1931. In order to secure information concerning its food value, two experiments, reported herein, have been conducted at the University of Maryland Experiment Station this year.

Wheat used in these experiments was grown by the University or by a near-by farmer, and was of good quality; it was coarsely ground for the lots which received ground wheat. No. 2 yellow shelled corn was used for such lots as received corn, and it was fed without grinding. Wheat was hand-fed Experiment I, and wheat and corn were self-fed in Experiment II. Minerals were self-fed in both lots; steamed bone meal, finely ground raw limestone, and granulated stock salt were fed in separate compartments in Experiment II, and in a mixture 2:2: 1, in Experiment I. Fishmeal was fed in two equal feeds each day in both experiments.

The pigs used in these experiments were raised at the University. Some were pure-bred Durocs, some were pure-bred Polands, some resulted from crossing these two breeds. It was planned to have all lots in a given experiment uniform as to breeds represented, number of each sex in each lot; and average initial weight.

As the two experiments differed in length of time through which they were conducted; in average initial weight of pigs; and in other particulars, it is not advisable to make direct comparison of the results secured from the two different experiments. Accordingly the results will be presented and discussed separately.

EXPERIMENT I

Supplementing Ground Wheat with Fish Meal, with Pasture and with both Fish Meal and Pasture.

Experiment I, in which 50 hogs were fed for 56 days in five lots of ten each, is briefly outlined in Table 1:

TABLE 1

Experiment I; September 11 to November 6, 1931, 56 days; 10 pigs in each lot

Lot Ration used:

A—Ground wheat; minerals; in dry lot.

B—Ground wheat; minerals; .3 lb. fishmeal daily per pig; in dry lot.

C—Ground wheat; minerals; access to mixed-grass pasture, 30 minutes daily.

D—Ground wheat; minerals; alfalfa, alsike, and rape pasture, full time.

E—Ground wheat; minerals; .2 lb. fishmeal daily per pig; alfalfa, alsike, and rape pasture full time.

Table 2 presents a summary of Experiment I and shows some important differences due to the use of the various rations:

The data presented in Table 2 are of interest in showing something of the need for using wheat in an efficient manner in case it is to be fed to hogs. Wheat and minerals alone were not adequate for meeting the demands of the young rapidly growing hogs, as shown by the slow rate of increase in weight, the large amount of feed required for a given increase in weight, and the small amount of feed consumed by the hogs which received only wheat and minerals in dry lot.

The lot which received three-tenths of a pound of fishmeal daily per head, in dry lot, produced gains at a rapid rate, needed a relatively small amount of feed for a given gain in weight, and consumed a large amount of feed. For some conditions this ration would be highly advisable.

Although some benefit seems to have been derived from giving the pigs in Lot C access to a mixed-grass plot for 30 minutes daily, no great saving resulted from this practice. It is probable that with more succulent forage better results would have been secured.

The full-time use of abundant pasturage as provided by a plot of mixed alfalfa, alsike, and rape, seeded with oats in the spring, and grazed after the oats had been harvested,

TABLE 2

Experiment I, September 11 to November 6, 1931; 56 days. 10 pigs in each lot

Lot No.	A Ground wheat; minerals	B Ground wheat; .3 lb. fishmeal daily per pig; minerals	C Ground wheat; minerals; mixed pasture 30 min. daily	D Ground wheat; minerals; alfalfa, alsike and rape pasture	E Ground wheat; .2 lb. fishmeal; daily per pig; minerals; alfalfa, alsike and rape pasture
	lbs.	lbs.	lbs.	lbs.	lbs.
Average initial weight per pig	63.75	63.55	63.90	63.50	63.45
Average final weight per pig..	101.75	151.50	105.35	141.60	160.30
Average gain per pig.....	38.0	87.95	41.45	78.1	96.85
Average daily gain per pig....	.678	1.570	.740	1.395	1.729
Feed Consumed (10 pigs).....					
Wheat	1843.6	2536.8	1837.8	2350.6	2700
Fishmeal	.....	166.5	.....	.....	111
Minerals	36.5	22.8	29.6	18.8	10
Pasture	.....	.....	(30 min. daily)	(approx.1 acre)	(approx.1 acre)
Total.....	1880.1	2726.1	1867.4	2369.4	2821
Feed consumed per 100 lb. gain					
Wheat	485.16—	288.44—	443.38—	300.97+	278.78+
Fishmeal	.....	18.93+	.....	.....	11.46+
Minerals	9.61—	2.59+	7.14+	2.41—	1.03+
Pasture	.....	.....	(30 min. daily)	(1 acre)	(1 acre)
Total	494.76—	309.96+	450.52—	303.38+	291.28—
Cost** of gain per 100 lbs.....	$5.04	$3.41	$4.58—	$3.44	$3.40
Returns per bu. wheat.....	$0.72	$1.14—	$0.79	$1.11—	$1.16

**Wheat, 60 cents per bushel; fishmeal 2½ cents per pound; minerals 2 cents per pound; no charge for pasture for Lot C; pasture for Lots D and E, $3.00 per acre for 56 days; gain in weight $6.00 per hundred pounds.

effected a decided improvement, as evidenced by an increased rate of gain in weight, a lessened amount of feed required for each hundred pounds of increase in weight, and a substantially increased feed consumption, as compared with the dry-lot groups which received no fishmeal.

The most efficient ration used for any of the five groups in this experiment was that which included wheat, fishmeal, minerals, and alfalfa, alsike, and rape pasture. The feed consumption by this group was large, the rate of gain was rapid—over 1.7 pounds daily per head for 56 days; and the amount of feed required per unit of increase in live weight was smaller than for any of the other lots.

In order to secure figures concerning the returns per bushel of wheat fed to the different groups, it has been estimated that the increase in live weight was worth 6 cents per pound, that the fishmeal cost 2½ cents per pound; the minerals 2 cents per pound, and that the pasturage consumed by each of the lots on pasture all of the time was worth $3 for the eight weeks. (It was evident, however, that the lot which received no fishmeal grazed somewhat more heavily than did the lot which received the fishmeal.) It will be observed that the lot which received only wheat and minerals in dry lot returned 72 cents per bushel of wheat consumed; followed in ascending value per bushel of wheat by Lots C, D, B, and E, with Lot E returning $1.16 per bushel for the wheat. The difference between Lots B, D, and E in this respect are small; rate of gain and other considerations need to be taken into account in order to determine which of these lots did best. These figures show in a convincing way that, with increase in weight credited at 6 cents per pound, wheat feeding may return a slight or a generous increase over recent Maryland market prices for wheat, depending upon the manner of combining wheat with other feeds in the ration. With wheat charged at 60 cents per bushel and other feeds at the rates given in the foregoing, gains in weight ranged in cost (feeds only) from as low as $3.41 to as high as $5.04 per hundred pounds.

Caution should be observed in making use of any financial

statement concerning the results of a feeding trial, for much depends upon the cost of feeds and upon the price for which the produce may be sold. The data concerning the amount and kinds of feed needed to produce 100 pounds of increase in live weight and the figures for rate of increase in weight are of much more importance than the financial statement except in those exceedingly rare instances in which there is encountered the same market conditions as were applied to the financial statement.

EXPERIMENT II

Comparison of Wheat and Ground Wheat,
Comparison of Wheat and Corn,
Comparison of Different Amounts of Fishmeal for Supplementing (a) Corn and (b) Wheat.

The following tables give the results secured from Experiment II, in which eight lots of 8 pigs each were fed for 84 days. In Table 3 there is presented a comparison of ground and whole wheat, and it will be noted that there was some saving of feed due to grinding, though the rate of gain in weight was more rapid when whole wheat was fed.

TABLE 3

Comparison of Ground and Whole Wheat

	Ground wheat; minerals; .375 lb. fishmeal daily per pig	Whole wheat; minerals; .375 lb. fishmeal daily per pig
	lbs.	lbs.
Initial weight per pig	68.35	69.22
Final weight per pig	220.10	225.56
Gain per pig in 84 days	151.75	156.34
Average daily gain per pig	1.807—	1.862—
Feed consumed:		
Wheat	3689.5	4217.4
Fishmeal	250.5	250.5
Minerals	24.6	28.8
Total	3964.6	4496.7
Feed consumed per 100 lbs. gain:		
Wheat	303.91+	337.08—
Fishmeal	20.63+	20.02+
Minerals	2.03—	2.30+
Total	326.57	359.40+
Cost* of feed per 100 lbs. gain in wt.	$3.60	$3.58

*Ground wheat, 60 cents per bushel; whole wheat, 54 cents per bushel; fishmeal 2½ cents per pound; minerals, 2 cents per pound.

Table 4 summarizes the results secured from the use of different amounts of fishmeal with corn and wheat. In every case the use of a larger amount of fishmeal was attended by a large feed consumption; a larger rate of gain; and a smaller feed requirement per unit of gain in weight. Ground wheat was more efficient per pound than shelled corn in every comparable pair of lots. Feed consumption was much larger; the rate of gain in weight was higher; and the feed required for a given gain in weight was smaller for wheat than for corn in every case in which ground wheat was fed in comparison with corn.

In order to secure information concerning the advisability of feeding wheat and corn together, one lot was fed shelled corn and ground wheat, equal parts by weight. The

TABLE 4
Comparison of corn with wheat; and of different amounts of fishmeal, with corn and with wheat

	.375 lb, fishmeal daily per pig		.250 lb. fishmeal daily per pig		.125 lb. fishmeal daily per pig	
	Shelled corn; minerals lbs.	Ground wheat; minerals lbs.	Shelled corn; minerals lbs.	Ground wheat; minerals lbs.	Shelled corn; minerals lbs.	Ground wheat; minerals lbs.
Initial weight per pig	69.29+	68.35	68.64	68.31	68.85	68.56
Final weight per pig	189.13	220.10	167.41	210.27	121.70	178.81
Total gain per pig	119.84	151.75	98.77	141.96	52.85	110.25
Daily gain per pig	1.427—	1.807—	1.176—	1.690—	.629+	1.312+
Feed consumed:						
Corn or wheat	2856.7	3689.5	2577.8	3741.85	1646.45	3134.45
Fishmeal	250.5	250.5	167.0	167.0	83.5	83.5
Minerals	43.8	24.6	33.1	20.55	27.25	30.2
Total	3151.0	3964.6	2777.9	3929.4	1757.2	3248.15
Feed consumed: per 100 lb. gain in weight						
Corn or wheat	297.93+	303.91+	326.23+	329.48+	389.39—	355.38—
Fishmeal	26.13—	20.63+	21.13+	14.71—	19.75—	9.47—
Minerals	4.57—	2.03—	4.19—	1.81—	6.44+	3.42+
Total	328.63—	326.57+	351.56—	346.00—	415.58—	368.27+
Cost* of gain	$3.72+	$3.60—	$3.87+	$3.70—	$4.52—	$3.86—

*FEEDS ONLY, Corn, 56 cents per bushel. See footnote of table 3 for other prices.

results yielded by this lot as compared with the shelled corn lot and with the ground wheat lot, all lots receiving .25 pound of fishmeal daily per head, are shown in Table 5. As compared with the use of shelled corn, fishmeal and minerals, the use of wheat and shelled corn caused a heavier feed consumption, substantially more rapid gain in weight, and a slightly smaller amount of feed required for a given gain in weight.

TABLE 5

Comparison of corn-and-wheat with corn and with wheat. All lots received .25 lbs. fishmeal daily per head

	Shelled corn; fishmeal; minerals	Shelled corn; Ground wheat; fishmeal; minerals	Ground wheat; fishmeal; minerals
	lbs.	lbs.	lbs.
Initial weight per pig	68.64	69.27	68.31
Final weight per pig	167.41	191.75	210.27
Gain in weight per pig	98.77	122.48	141.96
Daily gain in weight per pig	1.176	1.458+	1.690—
Feed consumed:			
Grain	2577.8	3269.6	3741.85
Fishmeal	167.0	167.0	167.0
Minerals	33.1	28.4	20.55
Total	2777.9	3465.0	3929.4
Feed consumed per 100 lb. gain in weight			
Grain	326.23+	333.69—	329.48+
Fishmeal	21.13+	17.04+	14.71—
Minerals	4.19—	2.90—	1.81—
Total	351.56—	353.63+	346.00—
*Cost of gains	$3.87+	$3.82+	$3.70

*FEEDS ONLY. See Table 3 for prices.

The results of these experiments show that wheat is a highly valuable feed for use in rations for hogs.

Wheat alone does not adequately meet the needs of young growing hogs, even when fed along with minerals.

Grinding wheat at a cost of six cents per bushel when whole wheat is worth 54 cents per bushel is slightly advan-

tageous, although the rate of gain in live weight was slightly higher, in this experiment, with the whole wheat.

Wheat uniformly produced more rapid gains than did corn in the experiment in which these feeds were compared. It is possible that the shelled corn was so dry as to make its consumption somewhat smaller than if new corn had been fed.

Wheat yielded much better results when fed with a small allowance of fishmeal than did corn, and there is strong evidence that wheat does not need as large an amount of fishmeal or other high-protein supplement as does corn.

The results of these two experiments indicate that wheat has a slightly higher value per pound than has corn, so far as feed cost per unit of gains is concerned, and that in addition, more rapid gains may be expected when wheat is fed.

The data concerning feed consumption, rate of gain in weight, and feed requirements per unit of gain deserve more attention than do the figures for cost of gains, as costs vary greatly with market prices for feeds.

In accordance with the report of the nominating committee, the following officers were unanimously elected.

President—Humphrey D. Wolfe, Glenwood, Howard County.

Vice-President—J. W. Jones, Olney, Montgomery County.

Secretary-Treasurer—B. E. Carmichael, College Park, Prince George's County.

Assistant Secretary-Treasurer—K. A. Clark, College Park, Prince George's County.

Executive Committee—J. Kieffer Funk, Hagerstown, Washington County; H. P. Miller, Grantsville, Garrett County; Ralph T. Wilson, Rising Sun, Cecil County; G. Bernard Fenwick, Glyndon, Baltimore County; H. N. Cohen, Easton, Talbot County.

Director of Farm Bureau Federation—W. R. Harvey, Corbett, Baltimore County.

Delegate to Maryland Farm Bureau Federation—W. S. Chichester, Aquasco, Prince George's County.

ADJOURNMENT.

REPORT

OF THE

Third Annual Meeting

OF THE

Maryland State Poultry Association

Wednesday, January 6, 1932

The third annual meeting of the Maryland State Poultry Association held in conjunction with the Maryland Agricultural Society, Maryland Farm Bureau Federation, was called to order at 9.30 A. M. on Wednesday, January 6, 1932, with S. M. Horst, of Mauganville, presiding, who gave the following address.

PRESIDENT'S ADDRESS

By S. M. HORST, Maugansville, Maryland.

Members of the State Association and Friends:

It is a great pleasure to greet you again.

The past year has taught us a great deal in regard to culling and feeding for a profit. I believe it would be a great benefit to review the prospects of poultry and egg prices for 1932. It will be necessary to review the past to a certain extent.

It now appears that the low egg prices of May, 1931, may have marked the bottom of a decline in egg prices beginning about December, 1929. Likewise, it seems increasingly probable that December, 1931, marked the low point in poultry prices for the decline beginning in June, 1929.

Favorable weather, cheap grain, and improving egg prices caused heavier egg receipts in September and October than had been expected. The result was some hesitancy in the egg market during the fall months and the selling of some storage stocks which slowed up the seasonable advance in egg prices.

However, with the heavier market receipts of poultry since the first of last year, and the reduced hatchings last spring, there is every reason for believing that poultry production has been reduced enough to prevent a new low in egg prices next spring. Likewise, with egg prices in a higher price level, the small crop of layers left over from 1931, and the desire to increase laying stock will work against new lows in poultry prices after the first month or two of 1932. Number of chickens on farms was at its lowest point in recent years on January 1, 1925. Poultry prices were at a high point in June, 1926, when the average farm price was 23 cents. Number of chickens increased steadily from 1925 to 1928. Poultry prices reached a low in December, 1927, when the average farm price reached 19 cents.

During 1928, production declined, so that number of chickens on farms January 1, 1929, was about 4 per cent smaller than the number on farms January 1, 1928. Poultry prices reached another high in June, 1929, when the average farm price was 24½ cents.

During 1929, production increased again so that on January 1, 1930, number of chickens on farms was the largest in the last seven years.

August 1, 1930, cold storage holdings of eggs were the largest in the last 10 years. On August 1, 1931, cold storage holdings of case eggs were more than 1,500,000 cases smaller than the year before. Cold storage holdings of frozen poultry were smaller on August 1, 1931, than August 1, 1930, when they were the largest since the summer, 1925. Receipts of dressed poultry at four important markets from January 1 to Sept 30, 1931, were eleven per cent greater than the same period in 1930. With storage stocks of poul-

try likely to be at a seasonal peak by February this year, it is not unlikely that the low in poultry prices was around December last year. With heavy marketings, a smaller number of chickens produced in 1931, and low egg prices that encourage close culling of flocks, which is what the poultryman should do, there is little doubt but what this year is starting with a reduced number of chickens.

With this kind of a set-up for poultry and egg production in 1932, it is worth while to look at some of the things that give an indication of the demand for eggs and poultry.

Egg prices have for a long time been quite sensitive to any slackening in business. The year 1911 was one marked by a business depression. Egg prices reached a low in June, 1911. Another depression year was 1914. Egg prices reached a low in June, 1915. There was another depression in 1921 and egg prices reached a low in May, 1921. The next depression came in 1923 and 1924 and egg prices reached another low in April, 1924. There was a mild depression in 1927 and eggs made another low in June, 1927.

Compared with the depression years of 1911, 1914, 1921, 1924, and 1927, poultry prices reached the low points in 1911, 1914, 1923, 1927. There was no low point in poultry prices in 1921 corresponding to the business depression at that time or to the low egg prices reached that year. This, however, is explained by the fact that the supply of chickens on farms in 1921 was the smallest of any year in the last eleven. Decline in egg prices, however numerous the contributing causes, generally run their course in around 18 to 25 months. Reduced storage holdings of eggs and reduced number of chickens are the main reasons for believing that May, 1931, was the low for egg prices.

It is plain, therefore, that while reduced number of chickens and reduced storage stocks for eggs are supports for stronger 1932 prices, any big increase in egg production next spring, induced by cheap grains and favorable weather, could easily make a new low in egg prices. Though there are some good reasons for believing that egg prices have

made the turn upward, any rushing or crowding of production in the near future can easily undo what progress has been made. Low spots in farm prices of eggs, with the exception of the war period 1915 to 1921, have been three to four years apart. A low in 1931 should therefore mean a fairly good price situation for eggs and poultry up to around 1934 or 1935 as far as one can see at present.

So much for the review. What we have to consider at the present time is better marketing conditions. We have been building up the production end for a number of years, but neglecting the most important part, for, after all, what good is an article produced if we are not able to dispose of it to an advantage.

In conclusion, I will repeat again as I have often stated: it is a shame, with the greatest markets at our front door, we have failed to market our poultry products to any advantage. We are running in the same rut as our forefathers. As the old saying goes, "What this country needs is a good five-cent cigar." What we Maryland poultrymen need is to teach the poultry consumer what a fresh egg is worth in comparison with lots of highly advertised breakfast foods.

THE VALUE OF CO-OPERATIVE EFFORT TO THE POULTRY INDUSTRY

By DR. T. B. SYMONS,

Director of Extension Service,

University of Maryland, College Park, Md.

I am very glad indeed to have an opportunity to speak to our poultry producers on the value of co-operative effort to the poultry industry.

It would seem particularly opportune at this time to consider seriously the possibilities of developing co-operative projects in various phases of this industry. Poultry is raised on 39,000 of the 43,000 farms in the State and the

industry has increased tremendously during the past five years. In 1929 more than 7,500,000 chickens were raised in the State and in 1930 there were more than 22,000,000 dozen eggs produced. The value of the industry can be reasonably estimated at about $13,000,000. We have over 100 hatcheries in Maryland with egg capacity of 5,000,000. Therefore, there is a wonderful opportunity for developing co-operative effort among special groups.

My feeling has been that we should start in a small way, selecting those localities where the interest seems to center and where the producers will be willing to do the things that are essential for a successful co-operative.

It goes without saying that we have some outstanding co-operatives in this State, such as the Maryland State Dairymen's Association and the Maryland Tobacco Growers' Association. If our farmers can co-operate in the selling of milk so successfully as is the case in the Baltimore milk shed, where more than 98 per cent. of the producers are selling their milk co-operatively, it seems that we should be able to do something along this line in the poultry industry.

In the tobacco industry we have our State Tobacco Growers' Association, which is an outstanding unit that has been handling the major portion of the tobacco crop for several years. This has resulted in bringing an unusual price for our product.

I want to say a word in behalf of the Agricultural Marketing Act, which declares it to be the policy of the United States Government to encourage co-operation among all of our producers. The officers and staff of the Federal Farm Board have co-operated whole-heartedly with us in this State and the Board has been sympathetic in assisting some of our co-operative organizations. I am hopeful that greater progress will be made in other lines in the State during the coming year and that we may approach the time when they will assist in the organization and development of our poultry co-operatives.

It is a fact that practically nothing has been done in co-operative marketing in the poultry field. We are making splendid progress in the campaign for controlling diseases and the Grow Healthy Chick Project and results from the record keeping on 184 farms.

There has been very little accomplished in breeds. Is it not possible for us to develop a section that would be known for high quality stock of a breed that would be best adapted to that section of the State? It is well known that in Denmark they have only one breed of hogs and, therefore, they are able to market their bacon in foreign markets successfully. Is it not possible to develop this idea in some sections of our State?

Perhaps the best opportunity for co-operative effort is presented in the distribution of eggs. Can we establish some centers where the growers will be willing to candle their eggs, grade them and sell them by auction, if necessary, as is now being done in New Jersey, or establish some other system of marketing that will be remunerative to the producers? Certainly we must have quality of product before we can expect to be successful in any co-operative effort. There is considerable interest growing in Caroline county along this line and I hope that we may be able to develop a center in this county.

I would also like to call your attention to the possibilities of co-operation in killing plants. I understand that during the past year at Enwood, W. Va., which was first established as a co-operative demonstration in the handling of fruit, a killing plant has also been established. During the past year more than 20,000 turkeys were killed co-operatively for the producers in territory surrounding that section. There is a great quantity of poultry sold from the farms of Maryland. If we could establish one killing plant and have the poultry graded, it would be a wonderful accomplishment.

Then, I would like to suggest that we do a little more in co-operative buying of feed by producers. We have an

agricultural corporation which is supported by all of our organizations and which is ready to serve the industry in the co-operative purchase of feeds. Let us see if we cannot in 1932 reduce the cost of these feeds to our producers and at the same time aid our State-wide co-operative organization in its development.

I want to take this opportunity to congratulate the leaders in the several counties that have held such fine poultry shows this fall. Certainly these county exhibits are wholly educational and give our producers an opportunity to observe standards of breeding that are well worth while. I do not think too much effort can be put into a plan for holding poultry shows in our counties.

There is an exhibit here in connection with this meeting and an attempt to have a dressed poultry exhibition. We are making a little progress, but it seems to me there is presented a wonderful opportunity for demonstrating to the city as well as to our country folk the proper manner in which poultry should be prepared for sale.

Another important matter in which co-operation is desired is the securing of funds for the development of the industry in the State. We need a poultry plant and building at the University of Maryland which will be worthy of this important and growing industry. We have been getting along for a number of years with very inadequate facilities. Is it not about time that the poultry interests of the State should see to it that adequae funds are appropriated by the legislature for the proper development of the industry at the institution?

Then we need more extension funds to meet the demands in the State. One poultry specialist cannot possibly get around to render the service that is desired. I hope that this association will give careful consideration to all phases of the industry, research, teaching and extension.

I think there is opportunity for co-operation in the advertising of Maryland poultry. Here we are, close to the greatest markets of the world. Nearby eggs should command

the very best possible price and yet we are permitting California to put a better product on the market and to secure better prices for their eggs than received for Maryland eggs. Let's decide to improve our quality and raise our standards of our poultry and poultry products so that our producers will come into their own by virtue of our geographic position.

We have a Five-Year Rural Agricultural and Home Program for Maryland. In that we have set out to accomplish certain goals during this period. I would like to call your attention to various aspects of this program. Among our goals is to have at least fifty per cent of our poultrymen members of co-operative associations. Let us study this program in our several communities and let us arouse our producers to the necessity of active co-operation in the development of these various aspects of the industry.

I want to again express my appreciation for this opportunity to discuss these matters with you.

THE VALUE OF THE MARYLAND STATE EGG LAYING CONTEST TO MARYLAND'S POULTRY INDUSTRY, AND WHY THE CONTEST SHOULD BE CONTINUED

By ROY H. WAITE, Professor of Poultry Husbandry,
University of Maryland

The Maryland State Egg Laying Contest is a product of the Maryland State Poultry Association. The contest was started on November 1, 1925, having been financed through the co-operative efforts of the Maryland State Poultry Association. The contest has completed six full years of 364 days each, but operations were suspended at the close of the sixth contest on October 30, 1931, due to the fact that an extensive building and campus development program of the university required that the site be vacated. the fences have been torn down and the houses have been moved to a temporary storage space on one corner of the chick range.

The Value of the Contest

In Experiment Station Bulletin No. 279 published in March, 1926, is outlined a list of items under the heading of "What the Contest Accomplished for the State." To show the value of the contest to Maryland's poultry industry, I do not believe I can do better than to present this list. At least it will serve as a starting point.

1. "The very complete, accurate and detailed records provide data which are useful in working out the solution of many of the problems involved in practical poultry raising. (As the project is supported by Experiment Station funds, this feature of the enterprise is kept dominant).

2. The contest tends to increase the average egg production in the State by bringing into prominence those breeders who have good laying strains of poultry, suitable for breeding and foundation stock.

3. It provides an opportunity for Maryland breeders to measure the productive capacity of their stock against that of breeders in other States. In case it is demonstrated that better stock is available in other sections of the country, Maryland poultry raisers are encouraged to bring this superior breeding stock into the State to improve the general quality. If Maryland stock is shown to be superior, the market for this stock will be extended through the country-wide publicity given by the published records.

4. An egg-laying contest stimulates an interest in better breeding, which will eventually result in improvement of the breeding stock, baby chicks, and eggs for hatching offered for sale in the State.

5. The greater general interest in poultry raising will insure a more plentiful supply, more even distribution, and a better quality of eggs on the markets supplied by Maryland poultry raisers, thus increasing the con-

fidence of the consumer and widening the market for the producer.

6. The creation and stimulation of public interest will result in more poultry being raised, thus adding wealth and taxable property to the State.

7. A contest provides a stimulus for an effective agency for teaching better management methods to the interested public.

8. The contest plant provides a permanent center of interest which breeders may visit to compare types and breeds and to participate in an interchange of views and ideas regarding poultry management.

9. It provides a contact between the College of Agriculture and the interested poultry raiser for interchange of ideas.

10. It provides a laboratory for demonstrating many of the principles of breeding and management to students enrolled in poultry courses in the College of Agriculture.

11. The contest brings a large number of visitors to the State, some of whom may be attracted by the many favorable conditions for poultry culture and decide to take up residence in Maryland.

12. An egg-laying contest advertises the State through the publication of the reports of the contest in numerous poultry papers and other publications that carry such items."

One contribution to the poultry industry that has been brought about by the egg-laying contests has been a rather complete and thorough churning or stirring up of the disease situation. This in my opinion has been a decided contribution to the future welfare of the industry, being one of those benefits not planned but one of the kind that just happen. I doubt if any one ever foresaw just what the

effect would be of egg-laying contests on the disease problem. Furthermore I doubt very much if the contests would have ever been allowed to go on and develop to the point that they have, if it had been generally known in the very beginning what the effect would be. Previous to the advent of the egg-laying contests there was some mixing, and transfer of disease through the agency of the poultry show. This however, was minimized to a large extent through the fact that the birds were cooped separately, on dry, wood floors, were only assembled for comparatively short periods, and quite effective sanitary precautions were usually taken. Some interchange of disease was of course brought about in the purchase and shipment of breeding stock. A large part of the interchange of stock in the early days was through the shipment of eggs for hatching. This naturally limited the spread of disease from community to community but of course it still complicated the picture somewhat in that stock that had never had an opportunity to develop an immunity to certain diseases might readily be introduced to a locality where such diseases were present. The interchange of stock from various parts of the country, brought about through the development of the baby chick industry, has been quite an influence on the disease problem though even in this case the scope of the interchange was limited almost entirely to small chick troubles and to the complications arising from the difference in immunity to prevailing diseases.

In the case of the contests, however, the situation was different. Here the whole range of diseases to which poultry are subject, were capable of being readily carried from the most remote sections of the country and brought together into a huge mixing vat. After a year's sojourn on the contest plant, where there was ample opportunity to come in contact with such diseases as were present, the birds in most cases were shipped to the owners to mingle with the home flock. In some cases the birds at the end of their contest year were shipped to a purchaser but in any event the effect was the same.

Many of you may begin to ask "Wherein does the benefit lie"? We have heard so much of disease prevention that it may seem paradoxical to attempt to point out a benefit from an actual spreading of disease. Perhaps I can answer best by asking you a question. Why is it that with all the disease germs shown to be loose in the world, we have any poultry at all? Why have these germs not wiped all chicken-kind off the universe? Why doesn't some one, severe, epidemic clean out all the chickens there are? The answer of course is very complex. There are many reasons. One of them is that we have a balancing up in nature. When one kind of life attacks another, compensating factors are set up. When a germ attacks an animal organism, such as a chicken, immediately is set up a defense movement on the part of the physiological processes of the chicken. At first the germ if it be a virulent one may make great headway but nature steps in with her balance and begins to even things up. The chicken develops a tolerance and resistance to the disease, the bacteriologist calls this an immunity and there are many degrees of immunity. Also there is actually very little known of the exact nature of immunity. The battle of the germs, terrific though it is, is carried on outside the vision of man. Man knows very little of the mechanism by which immunity is accomplished. There are numerous theories advanced from time to time and workers in science will likely solve the problem in due course of time.

However, so far as we practical poultry raisers are concerned, the important thing is to know and realize that there is such a thing as immunity and to make the best possible use of the tool nature has given us.

To get back to the contests, and their influence on disease. The nation-wide contest movement has mixed up the diseases affecting poultry and brought about a disease-climax that it is much more comfortable to look back upon than it would be to contemplate for the future. The mixing has been so thoroughly accomplished that no longer is there any particular reason to fear great epidemics starting in

one section of the country and sweeping through other sections, where either acquired or inherited immunity may not have been developed. It seems to me that if the contest movement has contributed nothing more than this adjustment of the disease situation it is well worth while.

My attention was first forcibly directed to the situation while our fifth contest was in operation. In the second Maryland contest we had an entry from a breeder who was using an extreme system of sanitation on his home plant and had been doing so for several years. The mortality in his contest-pen throughout the year was excessive; as I recall it he experienced the heaviest mortality of all the entrants. At the close of the contest he asked us to market his few remaining birds, stating that he did not wish to have disease brought on to his place. He dropped out of the contest for two years but finally wrote in to make inquiries concerning the sanitary conditions of our contest, stating that he wished to enter the fifth contest if conditions were right. I immediately answered his inquiry giving him a summary of our sanitary precautions as follows:

"Each pen is quartered in a separate house with wooden floor which is cleaned thoroughly by scrubbing and disinfecting before the new pullets are put in. We run three crews of cleaners during change of birds.

Each pen is yarded in a run 12 by 35 feet, that has been rested one full year. One yard separates each pen during contest year. For the most part yards are drained to prevent excessive wash from pen to pen. The edge of yards along the fences and parts of yard near house are treated with ground quicklime at start of contest. We remove all night droppings completely away from plant.

We take all these precautions but I am frank to say that the only way we could be completely sanitary would be to place a separate attendant at each house. There is no way of preventing the men from tracking droppings material from house to house. Then we have no way to control the flying birds or the earth worms that travel through the soil.

The pen that you had in the second Maryland Contest was in a house that had never been used before and ranged in a yard located at the upper end of a row of houses, on a side hill, so that there was not a chance for contamination from wash from an upper yard. Neither of the two yards that go with this house had ever been used for poultry before. Still we had trouble that seemed to come from infection of some kind. We have so little trouble of this nature, taking the contest as a whole, that we are quite strongly of the opinion that your birds either brought the trouble with them or they had been kept so sanitary at home that they had no chance to acquire any sort of immunity to common diseases. It also may be a fact that you are keeping things so sanitary at home that you are building up a strain of birds with no inherited ability to withstand and ward off diseases. I believe that there is such a thing as carrying sanitation too far. I would rather have a bird with natural resistance to disease than one that has been kept entirely free from contact with disease, for with the latter, one never knows just when the 'lightning' may strike. I guess moderation in all things is a pretty safe rule to follow. This seems to be certainly true in the poultry game.

We will be glad to have you enter a pen in our contest but I do not wish to hold out any false hopes, though we have breeders who send in pens year after year with practically no mortality at all."

This letter brought the entry. The birds arrived in due course and in fine condition. I had a particular interest in watching this pen. The house was cleaned thoroughly and given a good "shot" of disinfectant before the birds were put in. There was not a hitch in the way they were cared for and handled. In a short time they began to go down, one bird at a time until during the latter stages of the contest they were a motley bunch. It seemed perfectly evident that there was some deficiency in the powers of resistance of this strain of fowls to disease. In view of this experience and of much other corroborative evidence, it

seems to me that the question that should naturally arise is —"Do we want our strains of poultry with, or without, resistance to disease and are we willing to pay the price?" If the answer is for disease resistant strains, then I can see no better method of making sure that our breeding stock is kept in a state of reasonable resistance to the common diseases than through a liberal patronage of our modern egg-layng contests.

GROWTH OF CO-OPERATIVE BREEDING WORK IN MARYLAND

By W. H. RICE, Extension Poultry Husbandman, University of Maryland.

A co-operative poultry improvement and breeding project in Maryland was started in 1925 with the Maryland State Poultry Association and the University of Maryland co-operating. This work consisted of the inspection of houses and premises as regards sanitary conditions, and each bird used for breeding purposes was individually handled for standard breed quality and egg-laying capacity. Those birds meeting the requirements provided for, and being of desirable breeding quality, were banded with the official band of the Maryland State Poultry Association.

This work was designed as poultry certification work, and has been conducted continuously since its beginning by the Maryland State Poultry Association and Departments of the University of Maryland co-operating.

Two other features have been added since the work was first begun in 1925. Agglutination testing for Bacillary White Diarrhea or Pullorum Disease infection was started when the first flock, consisting of 75 birds, was tested in 1926. In 1931, Home Record of Performance supervision was added to the work. This work consists of inspection and supervised check of the home trapnesting records of which a fairly accurate check can be made through the cycles of egg production as to the time of day eggs are laid,

and number of consecutive days on which a hen lays. The facts on the hen's laying cycle as worked out by Professor Horace E. Atwood of the West Virginia Experiment Station and other authorities, makes it possible to supervise such records very accurately when egg entries on the trap-nest record are made by inserting the hour by the clock when the hens are trapped.

The general value of this co-operative breeding work is attested by its growth since its beginning as revealed on the following chart.

Year	Number Farms	Number Birds Examin'd	Number Birds Banded	Number Birds Tested	Number Reactors	R. O. P. Work	
						Number Farms	Number Birds
1925	8	.....	.....	.....	.....	....	.....
1926	16	3,459	2,127	75	.....	....	.....
1927	21	16,000	12,000	951	257	....	.....
1928	49	17,000	12,100	2,267	488	....	.....
1929	78	23,000	17,500	3,200	526	....	.....
1930	95	26,094	19,813	6,739	1,176	....	.....
1931	65	30,000	23,189	23,189	3,230	4	1,808

The economic value of this work has also been partially demonstrated in the "Grow Healthy Chicks" work, a demonstration project in poultry sanitation conducted by the University of Maryland Extension Service since 1926.

Results in this work for the five-year period, 1926-1931, show a weighted average of 9.1 per cent. mortality of chicks to maturity, where the whole "Grow Healthy Chicks" program was followed. Where chicks not from Certified B. W. D. tested stock were used, but the other seven of the eight points were followed, the average mortality was 15.9 per cent. The former group housed an average of 43.7 pullets for each 100 chicks brooded, while the latter housed an average of 37.9 pullets; these figures being a three-year average, 1929-1931, inclusive.

It is evident that the value of this work has been sufficiently demonstrated to fully confirm the sound judgment and foresight of those responsible for conceiving this co-operative improvement plan, and to recommend it to all poultry breeders of the State.

Following the educational program the election of officers and the business meeting took place. Results of the election were: President, Mr. William V. Lauterbach, Mt. Airy; Vice-President, Mr. Lloyd Holsinger, Denton; Secretary-Treasurer, Mr. Aaron Fell, Bethesda. Directors: Mr. S. M. Horst, Maugansville, to serve for one year to succeed Mr. William V. Lauterbach, who was elected president; Mr. Edgar L. Hargett, Frederick, to serve three years, to succeed Mr. Robert E. Day, Sykesville; Mr. John H. Moffett, Lynch, to serve the unexpired time of Mr. Lloyd Holsinger, Denton, who was elected vice-president. Mr. Charles Hines, Olney, and Mr. John Evering, Stemmers Run, are serving their second year, while Mr. Elmer F. Hastings, Parsonsburg, is serving his third year.

The annual report of the Secretary of the Maryland State Poultry Association is as follows:

Report of the Secretary-Treasurer

Mr. President and Members of the Association:

I am pleased to advise you that the Association has made greater progress this past year than in any previous year in both membership and certification and blood-testing work.

Annual Summer Field Day

Our annual poultry field day was held at Pioneer Point Farm, Centreville, Md., on June 18, 1931, and was the most successful field day that we have as yet held. The meeting was staged in the large arena on the farm, and at both the forenoon and afternoon meetings the room was crowded, many visitors having to stand.

The increased interest in these annual field meetings proves to us that the poultrymen of the State are taking more interest in the State Association and in its co-operative efforts for the interest of the industry within the State.

State troopers who had charge of the parking reported about six hundred automobiles at the meeting, and this would seem to prove that there were at least 2,000 people attending, all of them poultrymen or those deeply interested in the industry.

Every effort should be made to have this field day an annual event, and I hope that at this meeting plans will be discussed for the 1932 meeting.

Legislation

Your Secretary made several trips to Annapolis while the Assembly was in session on behalf of matters that the poultrymen of the State were interested. In all of these matters we had the closest co-operation of the Secretary of the Farm Bureau.

Certification and Blood Testing

At a meeting of the Board of Directors, held on June 18, 1931, the cost of certification and blood testing was further reduced.

Owing to the decrease in the cost of this work I am pleased to advise you that there was increased interest in the work and we have certified and blood tested about three times as many birds as the previous year. Furthermore, this year we have not certified any flocks that have not also been blood tested.

In round numbers I can say that we received applications for this work for about 32,000 birds. A further advance in the eradication of this disease has been made by the fact that several members are having their birds tested a second time in order to entirely eradicate the reactors.

I feel safe in saying to you poultrymen of this State that you can now purchase poultry, eggs and baby chicks from members of this Association that are as free from disease as you can from any other State in the Union. In looking

over the reports of the blood-testing work I can see a vast improvement in the flocks that have been tested in previous years; the percentage of reactors is getting smaller each year. At a meeting of the Board of Directors the matter of the way this blood testing should be done was discussed, and a resolution was passed that only the most approved method (the agglutination test) should be used and that no samples of blood should be drawn except by a representative of the University of Maryland or a licensed veterinarian.

Home Record of Performance Work

Again I am pleased to report to you that we have been able this year to start this most important work if we expect to keep pace with the other States. After considerable work we have been able to have four large poultry farms place a large number of birds under this work. All birds under this R. O. P. work have been certified, blood tested and found free from Polorum Disease.

Affiliated County Associations

At the present time we have three county poultry associations that are affiliated with the State Association. The record of achievement of these associations is most gratifying and proves the real value of this movement on the part of the State Association to help form these County Associations.

Special provision was made by the State Association whereby these County Associations could affiliate with the State Association and have a voice in State poultry affairs.

It will be our aim and effort this coming year to organize a number of other counties in the State, as we all must realize that much more can be accomplished by united co-operative effort than by several individual efforts or the efforts of scattered county groups.

Membership

Our membership has increased to a considerable extent this past year. However, it is not at all what it should be.

The cost of membership is so small (two dollars per year) that every poultry breeder in the State should not hesitate in becoming a member, thereby lending his support to the efforts we are making for the advancement of the poultry industry in the State.

In conclusion I wish to thank the county agents, the Extension Service and all who so willingly co-operated with me in my endeavor to make the State Association a strong organization working for the good of all poultry breeders and the industry as a whole.

SECOND MARYLAND POULTRY PRODUCTS SHOW

Considerable interest was shown this year in the second annual Poultry Products Show, which was held from January 5 to 8, in conjunction with the meetings of the Maryland Agricultural Society-Maryland Farm Bureau Federation and allied organizations.

The exhibit is put on for the purpose of stimulating interest in production, standardization, marketing and consumption of superior quality Maryland poultry and poultry products. It is purely educational and is conducted in the interest of producers, consumers and dealers alike. The object is to award recognition and give publicity to those poultry products produced, marketed and consumed in the State of Maryland.

Winners in the egg, baby chicks and dressed poultry classes are as follows:

Egg Department

Class I—The Certified Class (Brown Eggs)

*1st. Oak Grove Poultry Farm and Hatchery, Olney, Md.
2nd. Mrs. J. Harvey Quillen, Preston, Md.
3rd. Mrs. J. Harvey Quillen, Preston, Md.
4th. Mrs. J. Harvey Quillen, Preston, Md.
5th. Mrs. J. Harvey Quillen, Preston, Md.
*Sweepstakes Dozen—Silver Trophy.

Class II—The Bonded Hatchery Class (White Eggs)

1st. Oak Grove Poultry Farm and Hatchery, Olney, Md.

Class III—The Calendar Record Flock Class (White Eggs)

1st. Samuel Ahmuty, Odenton, Md.
2nd. Charles Cesky, Jr., Towson, Md., Route 6.
3rd. Charles Cesky, Jr., Towson, Md., Route 6.
4th. Charles Cesky, Jr., Towson, Md., Route 6.
5th. Samuel Ahmuty, Odenton, Md.

(Brown Eggs)

1st. Letcher L. Colona, Pocomoke, Md.

Class IV—The Producer Class (White Eggs)

1st. Wilbur M. Wolf Poultry Farm, Fullerton, Md.
2nd. Mrs. J. Harvey Quillen, Preston, Md.
3rd. Wilbur M. Wolf Poultry Farm, Fullerton, Md.
4th. The Elder Farm, Hyde, Md.
5th. The Elder Farm, Hyde, Md.

(Brown Eggs)

1st. Mr. Matt Harding, Cambridge, Md.
2nd. Mrs. M. Pauline Blandford, Brandywine, Md.
3rd. Mrs. John E. Darby, Boyds, Md.

Class V—The Junior Class (White Eggs)

*1st. T. Tracey Preston, Jr., Joppa, Md.
2nd. Paul Anderson, Joppa, Md.
3rd. Paul Anderson, Joppa, Md.
4th. Bertram B. Wiley, Jarrettsville, Md.
5th. Karl Ascherfeld, Jarrettsville, Md.

*Silver Trophy.

Class VI—The Commercial Class (Maryland Dealers)

*1st. Stevens Brothers, cor. Charles and Camden Sts., Baltimore.

*Baltimore Butter and Egg Exchange Silver Trophy.

Baby Chicks

General Classes

Class I—Barred Plymouth Rocks

1st. Summit Poultry Farm, Ridgely, Md.
2nd. Northside Hatcheries, Maugansville, Md.

Class IV—White Leghorns

1st. Northside Hatcheries, Maugansville, Md.

Certified and Blood Tested Classes

Class I—Barred Plymouth Rocks

1st. Oak Grove Poultry Farm and Hatchery, Olney, Md.
2nd. Oak Grove Poultry Farm and Hatchery, Olney, Md.

Class III—Rhode Island Reds.

*1st. Oak Grove Poultry Farm and Hatchery, Olney Md.
*Sweepstake Entry Chicks—Silver Trophy.

Class IV—White Leghorns

1st. Oak Grove Poultry Farm and Hatchery, Olney, Md.
2nd. Oak Grove Poultry Farm and Hatchery, Olney, Md.

Class V—White Plymouth Rocks

1st. Oak Grove Poultry Farm and Hatchery, Olney, Md.

Class VI—The Display Class (three or more breeds)

*1st. Oak Grove Poultry Farm and Hatchery, Olney Md.
*Silver Trophy.

Dressed Poultry

Class II—Broilers

1st. T. Jordan Dorsey, Annapolis, Md.

Class III—Fowl

1st. T. Jordan Dorsey, Annapolis, Md.

Class V—Turkeys (Tom)

1st. Mrs. John Darby, Boyds, Md.

Class VIII—Guineas

1st. T. Jordan Dorsey, Annapolis, Md.

REPORT OF MARYLAND SUMMER FIELD DAY

The Fourth Annual Maryland Poultry Field Day was held on Thursday, June 18, 1931, at Pioneer Point Farms, the estate of Mrs. Helena S. Raskob, Centerville, Maryland. This event was sponsored by the Queen Anne's County Poultry Association, the Maryland State Poultry Association and the University of Maryland Extension Service.

The meeting and exhibits were staged in the magnificent riding arena of the horse barn at Pioneer Point, while the meeting of the Board of Directors and presentation of gifts to Mrs. Raskob were held in the club room of the barn.

The Jeff Davis Post of the American Legion, co-operating with the Queen Anne's County Poultry Association, served luncheon from an outside tent.

Maryland State Police and the Centreville troop of Boy Scouts directed traffic and parked the cars.

Models of Maryland poultry houses and equipment, and the famous mechanical hen of the U. S. Department of Agriculture also featured the occasion.

An essay contest for the schools of Queen Anne's County was also a feature of the day. High schools were assigned the subject, "Does Poultry Pay on the Farm," and grammar schools the subject, "Why Pure-Bred Poultry Should Be Kept on the Farm." High school papers were limited to 1,000 words and grammar school papers to 250 words.

Through the deep interest and generosity of Mrs. Helena S. Raskob, $70 in gold prizes were awarded in the contest, $35 in each group as follows: first, $20; second, $10, and third, $5. The nineteen entries were judged by E. W. Grubb, county agent; Aaron Fell, secretary-treasurer, Maryland State Poultry Association, and W. H. Rice, extension poultry husbandman.

HIGH SCHOOL WINNERS

First—Adelaide Mullikin, Centreville High School.
Second—Ethel Connelly, Centreville High School.
Third—Mary Ruth Cross, Centreville High School.

GRAMMAR SCHOOL WINNERS

First—Marion Leary, Grasonville.
Second—John Farr, Sudlersville.
Third—Edgar Maule, Sudlersville.

Dr. R. A. Pearson, President of the University of Maryland, made the presentation of the awards at noon.

Over 2,000 people from nearly all sections of the State of Maryland and a few from adjacent States were in attendance at the program and visited the different departments of the farm estate. This was by far the most inspiring and interesting of the four annual summer meetings of the Maryland State Poultry Association to date.

DOES POULTRY PAY ON THE FARM

(First prize in essay contest won by Adelaide Mullikin, Centerville High School)

During the last few years the poultry industry has witnessed an immense growth in popularity. This has been due to several factors: the activity of the poultry press; the many poultry systems; attempts to meet the high cost of living, and a "back to the land" movement on the part of the city people.

The general belief is that poultry farming does not pay, and this is only too true in many cases. There is no branch of animal husbandry in which so many experimental starts have been made which have resulted in total ruin as in poultry farming. This is probably due to at least two causes: (1) beginning with too large an investment in capital and stock which requires an immense amount of energy and money to keep running, or (2) in many cases the business has been ruined at the outset by the inexperience of the promoters who were made to believe, by misleading statements and fascinating statistics, that poultry keeping is the quickest road to a large fortune. While there are many large, exclusive poultry farms which are paying good dividends and this number is constantly on the increase, yet the true meaning of the term poultry farming does not lie in this phase of work.

The greatest chance of success is attained by considering poultry keeping as a branch of the farmer's operations and making it one of the many departments of his work. The large, exclusive poultry plants should be left to those who have had years of experience in the care and management of birds as well as the sale and marketing of the products. By starting the business a branch of general farming, experience will come as the work goes on, a careful and systematic increase in the size and production of the plant can be arranged so that the poultry keeper can measure his capacity for large things as the increase accumulates. It

is with this thought in view that the subject of poultry farming is approached, the object being to show farmers and poultry keepers that in poultry keeping there is money to be made, money which in many cases could not be realized at all if it were not for this branch of farming.

The advantage of poultry keeping are many. The amount of land and capital required is not great. There are a great variety of products. These are easy to market. The money invested brings quick returns. The business is suited to persons of either sex. Land is made more fertile. Poultry utilize waste products.

Land and Capital Required

It is safe to say that in no other branch of animal industry is there so little need of an extended outlay of land and capital to make a successful start as in poultry farming. The investment in land is least for those birds which are not of a roving nature, as ducks and heavy fowl. With turkeys, and some other classes which by nature are wild, much more land is required. They do not thrive so well in close confinement. Five acres will amply accommodate one thousand laying hens and provide room for the rearing of the young stock to replace the old ones. Experiments show that less land is required than was formerly supposed. When many birds are kept on a small area the cultivation and sanitation must be more thorough. If scarcity of land is not a difficulty to be met, then the most economical method is to allow free range. If the feed is to be grown at home, much more land is required; about an acre for every one hundred birds. Growing chicks require much more range than adult birds. An abundance of park room or large runs should be allowed the pullets and cockerels. Fattening fowls require very little room; it is desirable to keep them closely confined during the finishing period, as a much greater gain in weight is secured by so doing.

Increase Fertility of Soil

Aside from the commercial value of poultry manure there is a great increase in the fertility of the land over which the birds run. On a general farm it is more economical to use poultry manure than to attempt to sell it. The manure should be carefully collected and used as a concentrated fertilizer for farm crops.

Factors of Location Affecting Production

A mild temperate climate is ideal, although poultry is successfully managed under a great range of climatic conditions. Factors of temperature should receive careful consideration. Extremes should be avoided, and locations which are characterized by rapid variations are undesirable. In the southern part of the United States, where the average temperatures are high, conditions are less desirable than the more temperate climate farther north. The prevailing wind direction should be determined and the character of weather which it brings will materially affect climatic conditions. Prevailing winds from over the land are most desirable, as the associated climate is usually dry. North to northwest winds are best. Atmospheric conditions should also be considered. Close proximity to large bodies of water, to low river valleys, or to the ocean usually bring a relatively high humidity, which is undesirable.

Soil

The ideal soil for poultry raising is an open, porous, sandy loam with an open, gravelly sub-soil.

Profits From Poultry

The first question asked of any business is "does it pay?" It can safely be said that poultry keeping pays a surer income year after year, on the money invested than any other business with which the farmer is connected. The time has passed when it was the unanimous opinion that

poultry does not pay. There are too many men actively engaged in it and making a comfortable living, as well as too great a number with yearly incomes well up into the thousands for there to be any doubt in the matter. It has been proved over and over again that failure cannot be laid to the business, but to the man at the head of the business.

Therefore to make poultry pay on the farm one must consider proper drainage, soil, climate, stock and above all other things must be experienced in the poultry business.

EXTENSION WORK IN POULTRY

Remarks by DR. T. B. SYMONS, Director

Mr. Chairman and Members of the Association:

It is a great pleasure to participate in this wonderful meeting of our association. I wish to add my congratulations to the association and appreciation to Mrs. John J. Raskob and the local committee for making such fine arrangements for the meeting, particularly for the privilege of holding the summer meeting at this wonderful spot on the Eastern Shore. I want to thank the representatives of the Department of Agriculture for the splendid exhibit that they have made at this meeting. Particularly do I call your attention to the mechanical hen which emphasizes the importance of nutrition.

A meeting of poultry raisers from all over the State such as this promotes friendship, increases confidence and develops co-operation in the industry. It is necessary for the representatives of this industry to assert themselves as poultry does represent a major industry in this State. Thirty-nine thousand, six hundred and forty-eight farms of the 43.203 farms in the State raise chickens. In 1929 over 7,500,000 chickens were raised in Maryland. We produced more than 22,500,000 dozen eggs. According to the census our daily production on April 1, 1930 was 1,779,000 eggs.

Then too, there has been a tremendous development in

the turkey industry and other poultry. There are more than one hundred hatcheries in Maryland that have capacity of five million eggs. It is estimated that over ten million baby chicks were hatched in Maryland last year. As stated by President Pearson, this industry represents more than thirteen million dollars and it ranks high with the other agricultural industries of the State.

I am supposed to discuss briefly "Extension Work in Poultry."

Egg Record Work

Perhaps the outstanding piece of work that has been done in the extension field by Messrs. Rice and Raper is the conduct of the farm egg record work. Last year more than 111 farmers kept an accurate record of egg production. There were 44,353 birds on these farms. The average production on these farms was 148.5 eggs from a bird, while the average of the State is only 70 per bird. It is pleasing to note that more than 298 farms are enrolled in this project during this second year. There is no doubt that we should stress record keeping in poultry as we do in the dairy industry. It is just as expensive, proportionately, to keep boarder hens as it is to keep boarder cows. I believe that the greatest good will come in testing poultry and keeping records of their production.

Grow Healthy Chick Campaign

In the Grow Healthy Chick Campaign fine progress has been made. The campaign recommended that poultrymen adopt the following eight practices.

1. Clean Chicks
2. Clean Brooder House
3. Clean Ground
4. Clean Litter
5. Clean Feed
6. Clean Management
7. Separate the sexes
8. Keep Records

Last year this work was carried out on 184 farms, which averaged approximately 1,000 chicks per farm.

For four consecutive years, those who followed the eight practices recommended in this work have lost less than 10% of their chicks to maturity. The average loss for the State in 1930 was 16.25% and in 1929 was 19.81%. Loss cut nearly in half in two years.

The Turkey Industry

Much attention has been given to those who have established the turkey industry in the State. Great credit is due such growers as Mrs. Baker, Mr. Jarvis, Mr. Biggers, Mr. Harris, Mrs. Rambo, the Stattlers, Darbys and others that should be mentioned as outstanding turkey raisers. This county, Queen Anne's, produced more than 35,000 turkeys last year, while the adjoining county, Kent, produced approximately 75,000. Talbot county produced about 40,000 birds. Therefore the Eastern Shore produces in the neighborhood of 200,000 turkeys annually, while the whole State produces a little less than half a million turkeys annually. This presents a wonderful opportunity for rendering service in the extension field as well as many problems to be solved.

Marketing Poultry

One of the leading endeavors of the service is to render assistance in the marketing of poultry. We are hoping to secure the co-operation of turkey raisers so that poultry may be killed and dressed at a central point. This would furnish an opportunity for grading and marketing turkeys in a systematic manner. We are studying the market preference for eggs. We learned recently that high quality eggs are being sold in chain stores. They are selling at one price at one point in the city and at a greatly increased price at another point in the city. It would seem that the producer is not receiving a just return in proportion to the sale price to the retailer. This survey is being extended.

We are hoping to assist in developing the broiler busi-

ness. When I tell you that within twenty miles of this place there are poultrymen who raise 125,000 broilers for the market you can appreciate what this business means.

Above all we want to urge the production of quality in Maryland poultry and poultry products. As pointed out by Dr. Pearson, this should be our great aim. We are fortunately located geographically, within two hundred miles of more than ten million people and should aim to produce poultry to meet these market demands.

I should like to see the association look into the question of quick freezing as applied to poultry. If we can receive chops and steaks under this process, why can't we do the same with poultry.

I should also like to suggest the possibility of the use of cellophane in the marketing of poultry. This presents a field for investigation that may prove profitable. If cigars can be wrapped in this material, I am wondering if this product cannot be used to protect poultry when exposed. This would likewise greatly increase its salability.

Agricultural and Rural Home Program

I should like to bring to your attention the Agricultural and Rural Home Program which has recently been issued. We had the cordial co-operation of the officers of this Association in the erection of the poultry phases of the program. As you will observe we shall hope to continue to reduce the mortality of chicks, double the number of poultry raisers who are practicing sanitary measures to insure low cost production of high quality poultry and eggs, extend our culling work, to make general the keeping of systematic records and cost accounts among poultry raisers and to enlist the co-operation of fifty per cent of our poultrymen in co-operative associations. We feel that every effort should be made to promote co-operative marketing, especially in the sale of eggs. We cannot be proud of the fact that practically none of the twenty-two million dozen eggs

that were produced were sold co-operatively. Here is a big field in which all of us can work. I hope that the poultrymen will follow the program and exceed the goals that have been set to be attained.

I should like to call attention of the association to our efforts to promote an exhibit of poultry products in connection with the Farm Bureau in Baltimore. We have never had an exhibit of our products.

I am interested in the poultry business because it aids in feeding the family and providing a budget or an income for the mother on the farm. Oftentimes during this distressing period through which we have been passing the sale of eggs and poultry has been the sole source of income that the mother has had to provide clothing as well as food in the home.

It is needless to say that we need additional funds to assist in promoting extension work among the poultry raisers of this State. We are only able to have one full time specialist and there are tremendous demands for service in all fields of the industry.

May we hope that this meeting will serve to arouse our people to the importance of the industry and possibility for its future development.

I am delighted to have had the privilege of attending this meeting. May we all endeavor individually and collectively to further promote this industry which is so adaptable to our State.

REPORT

OF THE

ANNUAL MEETING

OF THE

Maryland Tobacco Growers' Association

January 7, 1932

BALTIMORE, MARYLAND

The annual meeting of the Maryland Tobacco Growers' Association was held with the Maryland Farm Bureau Federation at the Lord Baltimore Hotel on January 7, 1932.

The meeting was called to order by J. C. Brown, manager of the Maryland Tobacco Growers' Association. The first speaker on the program was the Honorable Thomas Parran, president of the Association.

Mr. Parran made a few brief remarks regarding the Association's operations for the year 1931, stating that through its operations it had been a great benefit to the tobacco growers of Maryland, and that the Association was in a stronger position through the aid of the Federal Farm Board to carry on its operations so that the tobacco farmers of Maryland could market their tobacco in an orderly manner, which condition did not exist in the other tobacco growing areas of the United States.

Mr. Geo. I. Gardiner, executive vice-president of the Association, was the next speaker.

MR. GARDINER: The subject "Co-operation," assigned to me by your genial manager must have been an echo of by-

gone days in Maryland and, in fact, throughout the agricultural and industrial world.

It does seem at this late day, that every word that might be said on that subject could easily be picked from the subnormal brain of every man, woman, and child in Maryland, where it has been imbedded by word of mouth, pen or picture of every thinking man that has expressed himself on your problems in the last quarter of a century.

There is most certainly no word in the English language that has been spoken so much and used practically so little as the word "co-operation", but it seems in practice to fall in line with the little verse I saw the other day which reads:

"Three cheers for the favorite son,
Three cheers for the local pet,
For he finds when the fight is begun,
That, that is all he is likely to get."

I am sure that every thinking man who knows the value of words, will agree that there is no word of more actual value in the home, in commerce, in industry, and especially in the sale of our farm commodities and the purchase of our farm supplies than the word "co-operation." But unfortunately its value is almost relegated to the background for the little word "if."

If your Association had 90% of the tobacco this year, a more pleasing story would be ours to hear today and thousands of dollars more would be in the tobacco growers' pockets. If 90% of the farmers were members of the Maryland Tobacco Growers' Association, the tobacco would be sold for $1 per hogshead selling expense, and five cents more per pound. If 75% of the people of Southern Maryland had bought their fertilizer through the Association, your patronage dividend check would at least be $1 per ton more. If the Maryland Tobacco Growers' Association had not had the co-operation that it even has had, Maryland would be in the same fix as the South and the West are today, and if it does not get more co-operation on this crop than for-

merly, it is going to be in the same condition. Numerous and many more things could be mentioned, but time does not allow, nor do I think it necessary to go further into detail to convince this intelligent gathering that the most outstanding thing today for the success of our Association is 100% co-operation with the policies of your organization and do not expect your Association to do more for you than you do for your Association; and if you do your part, no resolution that you can make in 1932 will pay better in dollars and cents and in satisfactory conditions in your industry than this action on your part.

Only through co-operation can you or your organization progress. Progress in your organization cannot and will not come by force, but by understanding of the great benefit derived from this complicated franchise. We can but co-operate in 1932 to make the undoubted glimmer of light for better times now apparent spread its illuminating powers day by day until 1930-31 depression will be a thing of the past. Apparently, there is no doubt the bottom has been reached and up-building forces are at work. With your Association, which has been such a help to our Maryland farmers, further developing we can certainly look for a happy and prosperous 1932, which I hope each and all of you will have. So do not turn on the red light; your organization has rendered you a service both in dollars and cents as well as satisfactory dealing and maintained conditions in your industry in Maryland better than anywhere else in the world, and better than any other of your service. So let us keep on the green light and progress to better days.

In conclusion, let me ask you to do me a favor. I am not here to ask for charity; I am not here to ask for anything for myself, in which you will not also receive the same. If you will do what I am going to ask you to do, it will cost you not one cent, but it is going to cost you one h—— of a lot if you do not do it. I have in my barn forty hogsheads of tobacco and many more interests, direct or indirect, and that is worth many thousands of dollars, and you have the same, more or less. If you will get together

with me and this man and make stronger that great factor in our market, the Maryland Tobacco Growers' Association, all of us will get a return for our labor and provide for our homes and families. If you do not, this crop of the best tobacco ever raised in Southern Maryland is not going to bring a living price. I can see there are going on among the big interests ways and means to buy this crop in competition with the South and West, where there is nothing but starvation and failures of all banks and business houses. The same condition will exist in Maryland if we do not now fortify ourselves. With the value as a marketing factor, we all know the Maryland Tobacco Growers' Association is and can be made more so with a 100% co-operative spirit on the part of all."

Mr. Louis P. Ranft, tobacco salesman, whose subject was "Tobacco Market" was the next speaker introduced by Mr. Brown.

MR. RANFT: It is customary for a speaker to tell his audience things they like to hear, to intersperse his talk with stories that cause merriment and keep his listeners in a good humor and finish in a manner that will leave a halo about him. But, today I shall try to talk plainly, but seriously, and if I should say anything which might cause you to disagree with my humble opinions, I hope you will at least be charitable enough to feel I have been sincere.

We are standing on the threshold of a new year at a time when the world at large and our own country, in particular, is undergoing one of the most serious and far-reaching readjustment periods it has ever known. The time is at hand when it is imperative for every loyal citizen to think more clearly, reason more thoroughly, and act more definitely, than ever before.

The tobacco industry is generally recognized as demonstrating an unusual degree of stability, even throughout periods of depression. Confidence in the tobacco industry has been reflected to a marked degree, where in other industries doubt has taken its place. Indeed, this industry has been classed as "depression proof."

But if we are to maintain this satus, a good market, and a fair profit, the basis of all present or future tobacco products must be the tobacco leaf itself.

Buying, selling, and exporting of the crop must continue at a rate equal to the growth in consumption of tobacco products as a whole. This is a function which is equally necessary to the farmer and to the domestic, as well as the foreign manufacturers, and just as essential to foreign governments maintaining a monopoly.

The year which has just come to a close has demonstrated that very clearly, especially to the tobacco growers of Southern Maryland. The crop marketed last year was one of the commonest on record, as well as one of the most difficult for the farmer as well as for the seller to handle. Yet, compared with crops of previous years, it brought more money, grade for grade, for what has been sold.

There were a number of contributing causes for about one-third of this crop not finding a market:

First: The undesirability of the leaf itself for cigarette purposes.

Second: The decreased production of cigarettes, which caused domestic manufacturers to discriminate more closely in selecting tobacco for their purposes, and also decreases in their orders for the Maryland grades.

Third: More serious perhaps than the foregoing reasons was the decision of the French administration to abandon the use of all former so-called French grades of Maryland tobacco and their positive refusal to buy these grades at any price.

In addition to this, the readjustments which are taking place in Europe today are also having their effect on the exportation of American tobacco. Many of these foreign nations are increasing the duty on the importation of all tobacco. This, in addition to the limited means of some of these foreign countries, and their necessity to raise revenue, makes it impossible for them to pay the price that could be and should be paid for the American product.

The import duty on tobacco in England, for instance, is

approximately $2.50 per pound. In Germany the duty has been increased to about 22c a pound; Switzerland, 50c a pound. This duty added to the price and cost of exporting American tobacco to these countries, makes it almost prohibitive for them to buy any great quantity.

Where countries have a monopoly, such as France, Italy, Austria, and Sweden, there is no import duty which gives these countries the advantage in competing with the domestic manufacturers especially for the tobaccos in which we are interested: namely, the Maryland cigarette grades. This is another reason that France is in a position to confine her purchases to the more desirable grades of Maryland tobacco.

These are the primary causes which have left a stock of approximately 10,000 hogsheads of tobacco in the hands of all selling agencies.

The total withdrawals for consumption of cigarettes for the year 1931 was 6,200,000,000 less than the year 1930. Business has come to realize that its success depends ultimately on the consumer—purchasing power is the keynote of prosperity.

It was this purchasing power that was taken out of our market to a marked degree last year.

Let us take the domestic manufacturers first, or just the three largest domestic buyers of Maryland cigarette grades.

The largest of these buyers curtailed its orders, after the first shipment of last year's crop, 2,000 hogsheads. The second bought 50 per cent. less, and the third, whose normal purchases of Maryland cigarette types is from 4,000 to 5,000 hogsheads, bought only 2,000 hogsheads. In other words, these three buyers bought from 7,000 to 8,000 hogsheads less than their usual requirements, which very clearly demonstrates that, had the crop marketed last year been a cigarette crop, there would have been very little tobacco carried over, even though foreign exports fell off.

But the most serious loss to last year's market was the abandonment of the French grades by the French buyers (shipped only 4,000 hogsheads). This is too long a story to

go into at this time, but let me say briefly it was not a question of price at this time. The French administration has abandoned manufacture of the so-called a la Maryland cigarette and is manufacturing cigarettes as near as possible to the blend of the most popular American cigarettes, such as Lucky Strikes, Chesterfield, and Camels, and are now buying strictly cigarette grades.

Let me say in passing that France is one country that has been relatively unscathed by the present depression, and one of the reasons is as follows:

"Of the four leading commercial nations—United States, England, Germany, and France—France has the largest percentage of its population on farms or in rural districts—somewhat over one-half. Practically all of France is adapted to a diversified agriculture and most farmers contrive to produce a major part of their own food requirements on their land. Gardens are an important part of the French farms. Moreover, the farmer is not laden with debt. His earnest desire is to be debt free and to that end uses but little machinery. In France about 80 per cent of family heads own land. In the United States, about 10 per cent., and in England, 5 per cent."

That is why the French population is demanding the best smoke it can get and can afford to pay for it.

These are some of the reasons, as I have stated, the basis of all present or future tobacco products must be the tobacco leaf itself. In other words, if the Southern Maryland tobacco grower is to maintain his status, and continue to get a good price for his product, he must produce more of the better grades of tobacco.

I am fully aware of the fact that the soil and seasons are important factors, but nevertheless the grower himself will have to contribute his share by using every effort to bring about this result.

The world is overstocked at present with common tobacco and an over-production of common tobacco will bring a common price. Farmers in many areas have gone wild on tobacco production. In Kentucky, Tennessee and other

burley tobacco States, the crop being marketed is approximately five hundred million pounds, or over two hundred million pounds more than the normal absorption, and burley tobacco, the foundation of all cigarettes, is selling as low as 50 cents a hundred pounds, or ½ cent a pound.

Production has been in excess of consumption, and it is the old law of supply and demand which regulates the price.

But what are we going to do with the old stock on hand, and what are the prospects for the sale of the new crop? I know these questions are uppermost in your minds now.

Every effort is being made and has been made, and every channel known to the most experienced tobacco men in the United States and in Europe is being exhausted to find an outlet for the stock on hand.

First, a proposition was made to the French Government through the French Commissioner, and the answer is: "The administration does not want the 1930 tobacco at any price." So that your organization has done and is doing everything possible to sell this tobacco, and at the same time hold this market.

But do not expect your organization to perform miracles. You cannot cure over night what ills and mistakes the years have wrought.

Now what about the prospects for the sale of the new crop.

Any man who tells you what tobacco will do does not know what he is talking about, but we are certainly entitled to an opinion, and it is my humble opinion that the crop of tobacco coming to market from Southern Maryland this year will be the salvation of the Southern Maryland tobacco growers, because it is a cigarette crop.

But, let me admonish you to get your tobacco in good keeping condition before packing it. Assort and pack it as uniformly as you can and ship *all* you have to *your* organization so that it can be orderly marketed and sold through your own selling agency. And now finally: I have heard it said that if ever there was a time when your Association needed you, it is now. But let me say, "If there ever was a

time when *you* needed your organization, it is *now.* Both are in need of each other—and for success the result must be co-operation."

Following Mr. Ranft's address, Mr. Brown made a detailed statement of the Association's operations from a statistical point of view, showing in one respect a large increase in the membership as well as a greater loyalty to the Association from its members.

Following Mr. Brown's brief remarks he introduced Mr. E. G. Jenkins, State Boys' Club agent, who had with him the 4H Club members of Southern Maryland who were winners of the prize offered by the Association in a tobacco growing and selling contest, which prize was an all-expense trip to the annual meeting of the Association paid by the Association.

The winners of the prize were:

Melvin Catterton, Davidsonville.
Thomas Weems, Jr., Stoakley.
John Lyon, Bel Alton.
Francis Dyson, Brandywine.
Harry Davis, Mechanicsville.

This concluded the meeting, which was then adjourned.

REPORT

OF THE

Home and Community Committee Meeting

Maryland Farm Bureau Federation

January 7, 1932

BALTIMORE, MARYLAND

MRS. ROY WEAGLEY, Secretary

The ninth annual meeting of the Home and Community Committee was called to order at 10 A. M. on Thursday, January 7, 1932, by Mrs. Harry T. Williams, chairman.

After prayer, the group sang "American Farm Bureau Spirit" led by William R. McKnight.

Minutes of last meeting read and approved.

The first speaker, Miss Helen Pearson, Home Demonstration Agent of Frederick county, gave a splendid talk as follows:

The subject that has been given to me for my talk is "What can the Home Demonstration Agent do to help the Home and Community Department of the Farm Bureau in its Work." The word home seems to be the main one in both of these titles and we know the objective of the work of all of us is the improvement of the farm home and likewise the community for community life is dependent upon the types of homes that are found in the various localities. Since our aims are primarily the same it does not seem that it would be difficult for us to find some definite means whereby we could help you and you could help us. At the present time perhaps more than ever before do we have such

a medium afforded whereby we can work together for the improvement of the farm home and farm home conditions. This means, to my mind, can be found in the recent Agricultural and Rural Home Program, which the extension service of the University of Maryland has planned and which has been highly endorsed by the Farm Bureau organization as one of the strong co-operating agencies.

Many of you, no doubt, are familiar with this program and the goals which have been set up for a period of five years. Any who have not seen this program may easily secure one and I am sure you will find it most profitable to go over the entire program carefully, but with particular emphasis on the Home division.

I am not going to go into detail but in brief, the goals of this program deal with the exterior and interior of the house together with the economic and cultural phases of the farm home. Marketing is stressed as a means of adding to the farm income. Other important features are as follows: the acquiring of a better knowledge of the expenditures for household supplies, convenience in working centers of the house, better food and health habits, the improvement of home grounds and better planning for clothing, particularly the expenditures for clothing.

Someone has lightly said, "that to create a Home Beautiful is Woman's obligation whether she be rich or poor." Surely by approaching these goals will it be possible to reach one of the largest goals that has been set down in this program—for rural homes to realize that simple, comfortable and beautiful surroundings are the greatest assets that we have. More and more is it being realized that the general condition of the farm home has a great deal to do with the general attitudes of the members of the family living in that home.

Particularly has this been proven during the present time. When there has been a certain spirit developed throughout the life of the family it has helped to carry them through many of the discouragements that have come to them recently. There is no doubt but in homes where

conditions have more nearly approached this goal such a spirit has existed.

So if rural homes can approach an ideal in material things, which leads to a better environment for family home life what better goal could be set up. It is the background which the home supplies that helps to develop the right attitudes toward life in general, and better communities will be an outgrowth. The depression has not affected friendship or neighborliness.

Could there be any better objective for the women of the home and community department of the Farm Bureau and Home Demonstration Agents to set up than to work together in endeavoring to carry out such a plan as has been put before us? You can help us by making it possible to reach more homes in your various localities and to secure leadership to carry out such a program and we with Miss Kellar to help us can work out the details for carrying out the work, and as a result develop the spirit of the home and the community which leads to a greater satisfaction and contentment on the farm.

Vocal solos, by Mrs. F. Sidney Hammond, of Frederick county, lent a delightful variation to the usual program.

Greetings from Mrs. M. Melvin Stewart, our past State secretary, pleased everyone present. Mrs. Stewart is now civic chairman in Raleigh, N. C. One of her objectives is to establish a curb market as a special place for a Farmers' Exchange. She said that they will plant a community tree for Christmas and will celebrate the bi-centennial of George Washington, who was a farm boy and who beautified a spot in the country where he might spend his old age. Mrs. Stewart said that we women must, above all things, help to encourage the men to endure the stress of present conditions.

Mrs. Harry T. Williams, State chairman, said that we must economize but not by eliminating the things that help the farm women or the farm home but by striking out the superfluous political officers or office holders that are not a bit of good to the county.

Mrs. Leo A. Cohill, of Washington county, gave a fine and inspiring address.

Mrs. Mary McGolerick, of Frederick county, very ably recited "The Famine" from "The Song of Hiawatha."

As Mrs. Holsinger was unable to be present and take her place on the program, Mrs. Alfonse Boley, of Talbot county, filled the vacancy and told in a humorous way "What a Woman Can Do." She told very delightful stories to illustrate the causes of high taxes. She said that if we have any building or repairing to do, and have the money with which to do it, we should, by all means, do so this year as it would, not only be a good investment but help business and help the unemployed. She said that we must help get rid of the results of depression; we must learn to know about affairs, how to face them and how to adjust them. Mrs. Boley said, "Women have the disposition of 85 per cent of the wealth, which we must not hoard, but use and spend wisely."

She said, too, that she could depend upon a crowd like this convention to drive depression away; and that we should make ourselves responsible for the people in our own community; co-operate with the social worker; ask ministers about the needs; help the poor, sick and unemployed. "The ones who need help most we have to look for", said Mrs. Boley.

Officers were then re-elected to serve another year.

Adjournment followed.

REPORT

OF

Boys' and Girls' 4-H Club Conference

January 6, 1932

BALTIMORE, MARYLAND

The Conference was called to order by Mr. E. G. Jenkins, State Boys' Club Agent. There was a large attendance, and Mr. Jenkins requested that the gathering be informal, in the nature of a round-table discussion.

By request, the secretary read a summary of the minutes of the last meeting.

It was requested that the minutes of the present meeting be mimeographed and sent to those interested.

Since the accepted tendency in the United States is to move rather than to stay and solve problems, the theme of the meeting was announced as super-vision, under which the following problems were discussed:

1—How can 4-H club work enlarge the contacts for boys and girls in small communities?

Dorothy Tucker suggested 4-H club organization, Club Week, local camps and Camp Vail.

Miss Marian Swanson, Wicomico county, reported that they had aimed to organize a 4-H club in each community where there had been no clubs before. Every adult club is sponsoring a 4-H club and furnishing a local leader.

Another suggestion was for friendly competition in recreation by clubs and counties.

Miss Myrne Hendry, Howard county, stated that they have organized a club of older members who are making a study of a wise use of their leisure time.

It was reported that in some sections alumni clubs of the older boys and girls have been organized, and these members guide and lead the younger club members, so that they may develop leadership.

Another reported that the holding of a track meet gave the people an opportunity to have a good time together both old and young. The club members assist in some counties with Farm Bureau picnic and also plan and manage their own annual banquet successfully.

Mrs. J. W. Jones, Montgomery county, suggested that the backward boys and girls be helped, so that they may gain the confidence which is needed to bring them into the clubs.

Willis Cissell, Howard county, stated that they are trying to get their boys and girls to attend and take part in the club meetings. The local leaders and Extension agents are instrumental in getting the parents also interested.

Mr. C. M. Jones, Caroline county, stated that the scout work is being worked up in the schools. He feels that the scouting program would be helpful to some 4-H club members.

Mr. Jenkins expressed the belief that 4-H club work should be linked with scout work and vocational work.

2—How bring about opportunities for farm families to carry on activities together?

Mr. Stanley Sutton, Kent county, reported that in Kent county they hold general meetings of the Farm Bureau and boys' and girls' clubs with the whole family taking part in the program.

John Stiles, Montgomery county, reported that the clubs, by meeting at the homes of the members, are enabled to have the parents present, and so enlist their interest.

Mr. Albert Ady, Montgomery county, stated that a little show had done much to bring the members of the family together in exhibiting corn, etc., thus making friendly, inter-family competition.

Miss Ruth Day, Howard county, stated that, with the

help of the camp fires, to which the parents were invited, and also with the aid of the 4-H banquet, the parents become interested and take part in the program telling what they are doing to assist the boys and girls.

Miss Erna Riedel, Anne Arundel county, an outstanding 4-H club member, who stood second at the National Poultry Judging Contest and who has done many very unusual things, such as assisting in the raising of tobacco, even to the point of marketing the product, told of the helpful and interesting way in which she had spent her Christmas vacation. After donning overalls, she sawed fence posts, among other things, built a gate, stripped tobacco during rainy spells, helped to locate tobacco beds, blasted stumps and took others out with a stump puller, etc.

3—How reach more of those who need 4-H club work the most?

Mr. G. W. Clendaniel, Harford county, said he thought it essential that there be some hook-up with the public school system, since it would be possible to have contacts in this way that would otherwise be impossible. In Harford county, through an agreeable arrangement with the County Superintendent, about 25 clubs, out of 30, are in the schools. Also, in his county, the sympathy of the parents is satisfactory.

A representative from Montgomery county said it had been his experience that it was necessary to reach the parents before the boys and girls could be reached.

Miss Blanche Corwin, Montgomery county, reported that the local leaders had done more than any other agency in reaching club members who need 4-H club work the most.

Miss Hendry stated that it was considered wise to have the boys and girls already in the clubs take the responsibility of organizing new clubs, etc. These active members are really local leaders.

John Stiles, Montgomery county, stated that club work in the schools has disadvantages, for one reason because the members are apt to lose interest during the summer

months. He thought it advisable to have club meetings in the school house, but not during school hours.

One speaker approved of the club meetings in the homes in order to secure the home atmosphere.

Mrs. C. B. Norton, Montgomery county, stated that in the winter their club meets in the school, and in the summers at her home. These meetings are held each week at night.

Miss Hattie Brooks, Dorchester county, stated that some clubs meet in the school, and one meets in the home. When this club meets, the parents meet in the kitchen and give the girls the front room.

Mr. Jenkins advised that he considered most meetings adjourn too late at night.

4—How educate parents to help boys and girls take economic and social opportunities at hand?

Mrs. M. M. Stewart, Anne Arundel county, referred to the problems which had confronted Erna Riedel, and stated that she felt very proud of her achievements.

Merl Garletts, Garrett county, stated that his father is almost as much interested in club work as he is. He stated that before they had any 4-H club or vocational work his father had never exhibited potatoes at fairs; however, he began to make such exhibits after he became interested in the club work taken up by his son. Merl considered club work helpful to the parents as well as to the club members.

Mr. Ady considered that parents could be interested in adult education through parent-teacher meetings, the grange, etc. He reported that he had attended parent-teacher meetings where 4-H club members had put on part of the program.

Mr. Griffith, Montgomery county, stated that each year all the boys in each community are gathered together for a club tour. The parents enjoy showing what the children have done to increase and improve breeding stock, etc. Many boys now have animals as the outcome of 4-H club work.

Miss Corwin said that better meeting facilities for the average farm community will be the means of educating the parents.

Pascal Renn, Frederick county, thought the 4-H club and grange could go hand in hand by allowing the 4-H club teams to give demonstrations, etc. He said a greater thing than project work and what makes life worth while is the development of the social side.

Mrs. Jones stated that she considers a real challenge is in the fact that farm people, who are inherently as refined and cultured as any other group, want the best.

Discussing advancing standards it was noted that the songs at Club Week have improved year by year. Mr. Jenkins observed that club leaders have a real opportunity to improve singing in granges and farm bureaus.

Mrs. James Davis, Harford county, stated that she considered the success of club work depends largely upon the leaders.

Miss Corwin considered it to be a family proposition to get the parents interested, this being accomplished by getting across to the boys and girls the desirability of being living models of the four-fold life. This will cause the parents to realize the value of this character development, and be spread by them to other parents.

Miss Swanson reported that when a question was brought up in the advisory board of Wicomico county about organizing new clubs, many considered it more important to have girls' clubs than to have adult clubs.

Mr. Jenkins stated that 4-H club work should not compete with any other movement.

5—How can it be decided which ones are best fitted for farm management? Which for the city job?

Warren Tydings, Anne Arundel county, stated that he thought each one would have to decide for himself whether to stay on the farm or go to the city. Personally, he had found that the mad rush of people in the cities was not for him.

Another suggested that good books be furnished to the boys and girls to assist them in making their decisions.

Mr. Jenkins stated that a criticism had been made that boys and girls should not be influenced to go to college unless it is their own personal desire.

Mr. Clendaniel considered that this possibility should be presented to each person for his own decision. The advantages and disadvantages should be enumerated, but the leaders should not take the responsibility of saying whether a boy or girl should or should not go to college.

Miss Brooks reported that at a party given at their county camp the girls had been given an opportunity to dress up to represent what they would like to be when older. This was a means of bringing to their attention some vocations of which they had not heard before, thus opening up new avenues of thought and different opportunities.

Mr. J. D. Blackwell, Director of Vocational Education, commented that Miss Brooks' narrative implied vocational guidance. In the Maryland school system very little has been done in the rural districts along the lines of guidance, although this is done in the cities. He recommended the furnishing of good literature to the young people, and then allowing them to make their own decisions.

A representative from Frederick county stated that in the high schools a guidance plan is adopted. An effort is made to discover what the pupils like, and their courses are formed from that knowledge.

Mr. Blackwell said he thought no agricultural teacher intentionally forces a pupil to go to an agricultural college, however, the teachers are agricultural graduates, and in following the leadership of those whom they admire, boys might select similar training. Mr. Blackwell stated that the present school system in Maryland prepares high school pupils for college.

6—Do boys and girls really own what they raise and exhibit? What responsibility rests with leaders in this respect?

It was stated that a boy who does not own his exhibit

and who wins a prize with it discourages club work. The boy should be sole owner, and that will encourage others.

A representative from Montgomery county advanced the theory that a boy who does not own his project will not stick to club work very long.

Mrs. Davis thought that a boy who is going to exhibit anything as a club project should own it and prepare it for exhibit.

Mr. Ady stated that all calves and swine exhibited by the club members in Montgomery county are owned by them. Every animal owned by the boy is registered in his name. There is not a grade project in the county. Usually it is uncertain whether the mother of the child owns the poultry.

Mr. Sutton stated that all the projects in Kent county are owned by club members.

Mr. William Carroll, Baltimore county, reported that some boys have grade calves, but those who have purebred calves own them.

Mr. Clendaniel expressed his belief that partnership with with the parents might be held up as ideal.

Miss Erna Riedel related that she had some trouble in convincing her father when she started out. Everything she undertook seemed to be against his wishes, but after she had convinced him of the value of club work there developed a sort of partnership, and now they work jointly, making the work more pleasant and a family affair instead of an individual affair.

Mr. Jenkins presented Miss Dorothy Hinder of Baltimore county who won the first prize at the Chicago Show for the best clothing outfit.

At the request of Mr. Jenkins, John Joesting, Harford county, told how the attitude of most people, including those in the House of Delegates, is most favorable towards 4-H club members. He said the attitude towards the leaders goes hand in hand with the attitude towards club work.

In closing the Conference, Dr. T. B. Symons commended the club members for their interest and enthusiasm mani-

fested in the leadership movement. He thought the young men and women would be better able to make wise selections for future careers after having presented to them the larger and better things of life. He said that we are all proud of the club work in Maryland, although this work is in its infancy. There is a tremendous challenge presented to the club group. The youth of the land has never been presented with the opportunity that is now presented for solving the world's problems. Dr. Symons stated that, although a believer in the character and standards of club work and glorying in its accomplishments, still he ventured to say that none present were entirely satisfied, since there is a great body of youth that is not being reached. It would be ideal for the boys and girls to come together and take the lead in forming 4-H co-operative clubs; for instance, the marketing of eggs co-operatively. Of the twenty million dozen eggs produced in Maryland not one is marketed co-operatively at present, and Maryland's nearness to markets should make such a movement feasible. It might also be a fine idea for the club leaders to decide to allocate certain sections of the State to the raising of individual breeds of poultry, cattle, swine, etc. Dr. Symons stated that a State agricultural program had recently been launched; also, we have county programs, and now we are going to have farm programs. He asked the club leaders and members if they had given thought to a farm program that would be progressive and suitable for their counties and communities. He told the Conference that a farm accounting system is being developed, and the club leaders should be active in making this work successful. He stressed the missionary spirit among club members in order to reach the fifteen thousand boys and girls who have not had the touch of club work. Dr. Symons asked for advice from club leaders with regard to developing the radio work, which presents a real problem.

Before adjourning, the Conference expressed the hope that next year, at the annual convention, the club people have two meetings, one on Wednesday and the other on Thursday.

REPORT

OF THE

Stockholders

Maryland Agricultural Corporation

January 7, 1932

BALTIMORE, MARYLAND

The annual meeting of the stockholders of the Agricultural Corporation of Maryland was held on January 7, 1932, at the Lord Baltimore Hotel, in the city of Baltimore, State of Maryland.

Meeting was called to order by President James W. Davis at 10.30 A. M.

Roll Call of Counties resulted in representation from fourteen counties.

Minutes of the meeting of stockholders held in 1930 were read by Secretary Englar, and upon motion duly made by Senator D. G. Harry, seconded by Mr. D. S. Pearce, it was

Resolved that the minutes be approved as read. Voted. Carried.

Report of business for the year 1931 was made by Secretary Englar, giving the amounts on individual commodities.

We are sorry, said Mr. Englar, that we cannot give you as large a report as last year, but this is due to the decline in tonnage on feeds and fertilizers. We handled from January to December inclusive, nearly 15,000 tons of feeds. In going over our statement, we are glad to report, however, some items which were not so materially effected by a decline and which show an increase over the previous year —tires and seed. These are only small items but they help to build up. I cannot say this much for some of the other

commodities. Take binder twine; in 1931 we sold only 1,500 bales of twine as compared with 3,300 bales in 1930. Our feed and fertilizer business today is good, and if you will give us the same support along other lines as these, we will show you that we can materially increase our business and reduce the prices to the consumer. You must place us in a commanding position so we can go out and talk with people along the proper lines.

Financial statements of the corporation were presented to the meeting, and after the reading of same, it was unanimously voted that the statements be accepted as presented.

Committee consisting of Mr. D. B. McDowell and Dr. Hoopes was appointed to canvass the stock represented either by proxy or in person.

MR. DAVIS: I have not a written report of the activities of the corporation for the past year, but I can give you a pretty good picture of what the business has been. Of course, in the early part of the year we had a large purchase of feed which was bought at a very low price at the time of purchase. Then, we had a drop in prices, the like of which has never happened before and which varied from two to three dollars per ton, so in order that we might keep our prices in line, it was necessary to give our patrons the benefit of low prices. While the corporation has gone behind during the past year we feel that we are justified in doing so. During June and July and since, the low prices on feeds have very materially reduced the amount of our dollars. We still have a very substantial organization. We did not ask our agents to go out and sell too much feed and fertilizer for we knew collections were hard and we felt we would rather do less business than to come out at the end of the year with a heavy loss.

We have done a pretty fair grain business. While our grain sales statement shows a loss, we have really made money on it this year, and the deficit appearing thereon is part of the organization expense incurred last year. This has been reduced during the past year.

Report of the committee to canvass stock was made as follows: "We have gone over your proxies and find that you have a total of 884 shares represented, together with a personal representation of 12 shares, making a total of 896 shares. You have on record 1,338 shares of voting stock and to have a quorum it is necessary to have represented one-half of this amount or 669 shares. We have exceeded a quorum by 227 shares and are in position to legally carry on this meeting.

Nomination of Mr. B. John Black to act as chairman of the stockholders meeting was made by Senator A. G. Ensor, seconded by Mr. D. S. Pearce. Voted and carried unanimously.

MR. BLACK: I want to say that this is an honor I did not expect at all, nevertheless I am happy to serve you. Now what is the desire of the meeting?

Election of directors from the counties resulted as follows: Allegany, none; Anne Arundel, C. Ashby Duvall; Baltimore, Chas. T. Cockey, Jr.; Caroline, H. H. Nuttle; Calvert, H. Clare Briscoe; Carroll, Harry I. Rinehart; Cecil, David B. McDowell; Charles, W. B. S. Chapman; Dorchester, Guy S. Phillips; Frederick, M. Frank Holter; Harford, Walter S. Spencer; Howard, J. Wilson Lord; Kent, E. Thomas Massey; Montgomery, J. W. Jones; Prince George's, Clarence M. Roberts; Queen Anne's, J. B. T. Merrick; Somerset, Lloyd T. Widdowson; St. Mary's, Jos. M. Mattingly; Talbot, Carroll Lowe; Washington, Roy C. Weagley; Wicomico, none; Worcester, R. Newell Stagg.

Resolved, That the secretary be instructed to cast a blanket ballot for the aforementioned as director for their respective county to act for the ensuing year and until such time as his successor be chosen and qualifies. Voted. Carried.

There being no further business the meeting adjourned at 11.45 P. M.

REPORT

OF THE

Second Annual Meeting

OF THE

Farm Bureau Secretaries and Farm Bureau Insurance Agents

Thursday Morning, January 7, 1932

BALTIMORE, MARYLAND

The second annual meeting of the Maryland Farm Bureau Secretaries and Maryland Farm Bureau Insurance Agents convened at 9.30, January 7, 1932, with R. W. Richert, State agent, presiding. Mr. Richert in opening the meeting expressed his appreciation of the hearty co-operation existing between the two groups assembled, and referred to the accomplishments which had been achieved. He made suggestions as to the possibilities of further development, which would most assuredly follow with better understanding as to just how the respective groups could work together. Mr. S. A. McCabe of the United States Employment Service was then introduced.

MR. S. A. MCCABE: I thank you for the opportunity to say a few words to you for in my travels throughout the State I have been impressed with the large number of policyholders by the rural owners of automobiles in Maryland, and when I came here this morning the reason was apparent to me, for while I knew what your organization was at work, I had no idea that it had reached the efficient stage that this large and intelligent group registers. I

regret my over-sight in not bringing to you this morning some of the figures that I have completed, but will most assuredly see that Mr. Richert receives them, and I want you to feel that if there is any help our department can give you, it will be glad to do so.

Co-operative Automoble Insurance

MR. M. D. LINCOLN, Secretary and Treasurer
Ohio Farm Bureau Insurance Company

The American farmer today finds himself in this position. Let the figure 100 represent the average prices for the period from 1906 to 1914.

Wholesale prices on commodities, including farm products	100
Farm Wages	120
Average price of things the farmer buys	125
Farm taxes	250
Price of farm products the farmer receives	70

The farmer's mortgage indebtedness is nearly three times what it was in pre-war days; his taxes are 2½ times pre-war taxes; land value is practically back to pre-war, but the prices for his products are 30 per cent under. In the grain and live stock sections this figure is still lower for those products.

To me there is no one answer to this problem, but the most important is organization. Outside of a farmer's own individual production tasks, every other job involves co-operation with his neighbors, for effective results. Much progress has been made in the development of co-operative marketing and co-operative purchasing. Co-operative insurance is the thing I represent here today, and we are very appreciative of the part the Maryland Farm Bureau is taking in the development of this enterprise.

The Farm Bureau Insurance Co. has 80,000 policyholders, assets of $2,679,371.97, and a surplus of $350,000, and in

addition has paid many thousands of dollars to the State and county Farm Bureaus.

If our 80,000 policyholders would start out today to buy equal insurance protection in the average old line insurance company, it would cost them about a million dollars more money per year than they are now paying for what I believe is the best insurance available. Insurance at the farm risk rate shows what farmers can do by applying the principle of co-operation, to cut their costs. We have only started in this insurance field. Lately we have offered a theft insurance policy, and have travel accident. Health and accident, life, live stock insurance, and others some day will come. Insurance can be made a real factor in assuring a stable farm income by translating extraordinary hazards into known costs.

There is a new field into which I believe Agriculture should look, and apply the same principles of co-operation, and that is credit. I predict when farmers do organize their own credit machinery it will secure results far greater than any we have obtained through these other lines of activity. We need new credit machinery in order that we may make loans available to farmers on a basis that is more adaptable to agriculture, particularly as to length of time, and the interest rate.

We need a co-operative credit system in order to untie the hands of the farmer from borrowing money of some old line agency, in order that he may patronize his co-operative buying or selling groups at will. We do not need more deposit-taking institutions, but we do need more machinery better adapted to agriculture's needs.

There is a wholesale rate for credit, as well as a retail rate. The Ohio Farm Bureau, up until recently, has been borrowing money as low as 2½ per cent. We should organize ourselves with credit machinery in order that we may eventually tap the big sources of finances and bring money into the community rather than sending so much of it out in other forms of investment, as has been the case in the past. To organize in order to secure a fair system of

taxation and more economy in government is also essential in cutting our farming costs.

I commend the Maryland Farm Bureau for the splendid work you are doing. We are proud to be partners with you in the insurance project and we bespeak for you the highest measure of success in the coming year. The relationship with your present officers, President Davis and Secretary Payne, has been most pleasant and we urge you to support them fully in carrying out this plan of co-operation which cannot help but be of great benefit to the farmers of your State.

How the Agent Can Further Farm Bureau Work

MR. H. W. SMOOTS, Sales Manager
Ohio Farm Bureau Insurance Company.

The Farm Bureau Mutual Automobile Insurance and the Maryland Farm Bureau, each a separate and distinct organization, rendering separate and distinct services, do, as suggested by their names, have much in common. It is necessary to operate each as a separate unit but the spirit underlying each is the same. That is to render an economical service to the farm and rural folks in their respective communities. It is the result of this underlying principle that has made it possible to enter into a working relationship which makes it possible to work together for the good of all concerned.

Insurance is by nature mutual. It is but the uniting of a large group that is willing to share the losses of the few less fortunate, which makes it that way. In turn the Farm Bureau Organization is mutual, for it is but the uniting of the effort of those interested, by which certain accomplishments are attained for the good of all interested. We might say that Farm Bureau is mutual and insurance co-operative as well as Farm Bureau co-operative and insurance mutual. As a result of this similarity the united effort of these two becomes practical.

As long as each organization practices the true spirit of

co-operation this friendly working relationship will exist and just as long as you and I, representatives of either, or both organizations practice true co-operation we will help this relationship to exist.

Farm Bureau, its name and what it stands for, has a tremendous amount of prestige in almost any State or community and you, as local representative of the Farm Mutual Automobile Insurance Company, have a distinct advantage in presenting the service you have to offer. As a result of this, your conduct and activity in your respective communities will have a very great influence on maintaining this prestige or developing it to a greater extent.

While we talk insurance and insurance production, yet to those of us directly in charge of insurance work automobile insurance is only another Farm Bureau activity. The pleasant working relationship that has existed between the Maryland Farm Bureau and the Insurance Company in the past has been to the mutual advantage of all concerned. I cannot help but feel that the activity of the local insurance agent has, indirectly, been of considerable advantage to the local County Farm Bureau, and every local agent should appreciate that an active County Farm Bureau, State or National organization is to his decided advantage in the selling of insurance. It is as a result of this mutual benefit that there should exist the very closest working arrangement both between the local agent and county secretary and between the State organization and the insurance company.

I appreciate that both parties meet resistance in the field that can be much better taken care of by a thorough understanding and a common knowledge of the activities of the Farm Bureau and the insurance company. Sales resistance today has been as highly developed as has selling. But there is one thing in existence over which there has been no sales resistance developed at the present time sufficiently great to off-set it, that is enthusiasm. Therefore, enthusiasm is the one essential thing each of us must have and there are only two or three fundamental principles necessary for one to obtain it.

First, one must be himself, be natural.

Second, he must know his product. In this, it is essential that the insurance agent know the Farm Bureau workings, plans, etc., while the county secretary should be thoroughly familiar with the operations of the insurance company.

Third, by being yourself and having a thorough and familiar knowledge of the product that you are representing, it is easy to present the proposition in a straightforward, clear cut and frank manner.

If you follow these few fundamentals and enter into it with good spirit and enthusiasm, along with the pleasant working relationship between the Farm Bureau and the Farm Bureau Insurance, you should accomplish, not only what you have in the past but exceed the fondest expectations in the future.

MR. F. M. PAYNE, secretary and treasurer, Maryland Farm Bureau Federation.

My dear friends: I have been wishing for this opportunity for a whole year to say something more or less definite as to what must be the purpose on the part of every Farm Bureau president and secretary in each county when considering the sale of automobile insurance.

We are receiving through this service a revenue which is responsible for the splendid treasurer's report which I gave you yesterday to a greater degree than any other branch of our work. If we are to continue to receive this needed help in furthering Farm Bureau work, we most assuredly must earn it. Individually, I approach all questions alike, and if I am convinced that I do not earn, I most assuredly will not continue to receive the pay. Frankly, I feel that many of our County Farm Bureaus have not supported actively the agents in their counties to the point where they are earning the commissions accruing to them, and what I want to say to you is simply this. The way that you can earn it is to help those selling insurance in several ways:

1. Be in a position to keep a prospect list in the hands of the agent.

2. Be watchful for any discontent or complaints, so that the proper and knowing authorities will be able to adjust them.

3. A business of this kind requires the highest type man possible. Therefore, it is your job to keep the sales manager, R. W. Richert, at all times posted as to those in your county who would make the best representatives.

Now to you agents, one word and then I must be through. You are working on a commission basis. After long experience as a salesman, I find there can be no more satisfactory arrangement if you work in this particular field. However, where your competitors are on the job constantly and daily, every day that you consult your own desire as to whether you want to work or not most assuredly gives to him (your competitor) a decided advantage. So it behooves you to map out your program with the objective in view that you will stay on the job to the point where you conscientiously feel that you are covering your territory to the mutual advantage of yourself and the company you represent.

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